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Protection of the Circulation in Surgery

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THE protection of the circulation under any condition must have its roots in a knowledge of the physiology and the pathological physiology of the cardio-vascular system. Without an appreciation of the physiological requirements of the myocardium it is impossible to predict and to meet the exactions of the abnormal conditions attendant upon surgery. Without a physiological insight into the hemodynamics of the circulation, the peripheral vascular changes incident to surgery remain obscure. From these baselines all clinical approaches to the intricacies of the problem should logically begin.

The specialized portion of the vascular tube that is termed the heart has as its most important functional element the myocardium. Muscles demand oxygen, glucose and insulin for their proper metabolism. The myocardium has the interesting ability to maintain its glycogen reserve under the most adverse conditions. In glucose deprivation and starvation the myocardium is the last muscle to lose its glycogen. This store is preserved even under great physical effort, provided the supply of oxygen be maintained. Oxygen want leads to an early depletion of the glycogen store in the myocardium and to heart failure. Under ordinary conditions the endogenous sources of insulin are adequate for all purposes.[1]

In the clinical application of these physiological principles the diet through its carbohydrate content, conserving and replenishing the myocardial glycogen, may be expected to afford an ample source of energy. It is, therefore, wise to supply 250 to 300 grams of carbohydrate in the diet daily for two weeks before surgery, if possible, and thereafter to resume this level as early as feasible. The parenteral routes should be employed only in emergency and for the assurance of absorption. The strength of glucose solution, given intravenously, becomes an important clinical question when isotonicity is exceeded. A 5% solution of glucose is isotonic with the blood and concentrations above this level are rendered isotonic by drawing tissue fluid into the circulation. Thus, while hypertonic glucose solution actually affords a higher caloric value, its implied danger in overloading the circulation must not be minimized or overlooked. To avoid this danger, of course, the glucose solutions should be given intravenously at speeds inversely proportional to their tonicity. Insulin may be required for its proper utilization. Oxygen atmospheres of 40 to 60 volumes per cent are logical adjuvants in the prophylaxis of myocardial failure pre- and post-operatively.

The anaesthetic agent should be carefully considered in the protection of the circulation. Inhalation anesthesia, especially with chloroform, has been indicted for circulatory collapse through myocardial depression. The growing evidence indicates faults in conduction as the basis for these results that may be very serious. Spinal and local anesthetic agents are not free from similar dangers.[2] Particular attention is directed to a singular hazard that attends spinal anesthesia. If the level of such an anesthesia reaches the intercostals, circulatory collapse may ensue.[3] Ephedrine offers protection against this danger. Nor should the antidotal action of the barbiturates be overlooked in the preparation for local anesthesia with cocaine or its derivatives.

In addition to intravascular forces many extravascular factors contribute to the normal circulation. Muscular effort is important in forcing the blood back toward the heart. The alternating respiratory phases materially assist in moving the blood into the thorax. Postural changes are added forces in the circulation. The surgeon must not overlook the patient and his circulatory problem in the interest of an esthetic or a mechanical result. Therefore, circumstances aside from the avoidance of hypostasis may well determine the encouragement of physical and respiratory activity in apparent compromise with the surgical dictum of absolute post-operative rest.

Nor is the problem of the protection of the circulation in surgery resolved in such general and simple terms. There are many deviations from the normal, both in the subject and in the reaction that require special consideration. If the patient suffers from a cardio-vascular handicap, the surgeon in conference with the internist and the general practitioner must be ready to answer whether the suggested operative procedure be one of expediency or of necessity. Clearly in the latter case surgery may be attempted in the face of apparently contraindicant cardio-vascular hazards; whereas if

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expediency be the indication, the consulting physicians may well counsel delay in the interest of the patient. Indeed, the decision may defer the surgical intervention indefinitely, if in the mature judgment of the consultants the cardio-vascular situation should carry a greater threat than the complicating condition for which surgery is indicated.[4]

CLASSIFICATION

The classification of heart disease promulgated by the American Heart Association incorporates the important detail of functional capacity. Four grades of competency are included under this heading:

Grade 1. Patients capable of ordinary and unusual effort without symptoms referable to the circulatory system; no limitation of work and earning capacity. The vital capacity of these patients is in excess of 90 per cent of the predicted figure.

Grade 2. Patients capable of slight effort without circulatory symptoms but experiencing some difficulty upon unusual effort; no limitation of work and earning capacity. Their vital capacity ranges from 70 to 90 per cent of prediction.

Grade 3. Patients incapable of ordinary effort without circulatory embarrassment; definite limitation of work and earning capacity. In this group the vital capacity is between 40 and 70 per cent of prediction.

Grade 4. Patients experiencing circulatory distress at bed rest; no work or earning capacity. Their vital capacity level is below 40 per cent of prediction.

From this simple formula it is possible to give a reasonably accurate estimate of the patient's capacity to withstand the physical strain of major surgery. Indeed, the physical exactions of daily life exceed those of an operation under a *properly* administered general anesthetic.[8] So important is this detail that the choice of the anesthetist takes precedence over the election of the surgeon in the handicapped cardio-vascular subject.

In the last analysis the patient is a biological variable, and arbitrary rules are singularly inadequate. Never should such formulae as have been enunciated lull the clinician into a sense of false security on one hand or excite unjustified concern on the other. Cardio-vascular patients with functional capacities of Grades 1 and 2 should experience no difficulty from surgery. Those falling into Grades 3 and 4 may be expected to encounter much more serious circulatory reactions. Yet the most serious cardiac cripples may pass through protracted surgical procedures of the first magnitude without the slightest evidence of circulatory stress, while apparently slightly handicapped subjects at times respond to lesser surgical burdens by symptoms of grave circulatory collapse.

CARDIAC LESIONS

The protection of the patient with a known cardiac lesion against the strains of surgery of expediency or of necessity involves the same principles of therapy. The time factor in marshalling the forces of protection alone differs. Rest should be invoked to build the reserve of the myocardium. The criteria of the limitations of physical effort are within the bounds that avoid breathlessness, cardiac consciousness and fatigue. The occurrence of these symptoms implies a trespass upon the myocardial reserve. On the other hand, in the pre- and post-operative course of this cardiac subject rest must not be carried to such extremes as to produce hypostasis. In fact, experience would indicate that in some patients a certain physical demand upon the myocardium is at times necessary to improve its tone and the circulatory efficiency. Mild sedatives are valuable adjuvants in a rest program. The diet must contain the essential food stuffs. Carbohydrates are especially important as the readily available energy source for the myocardium. Proteins and vitamin B_1 must be afforded to supply tissue needs. Oxygen may be given pre-operatively; but in most instances its adequate supply during anesthesia and in post-operative convalescence will give the desired protection. Aminophyllin (1½ grains three to four times a day) may be useful in the patient with coronary sclerosis. Digitalis has an established position in the prophylaxis against heart failure. Its use should not be routine in all cardiac patients submitted to surgery. Frank decompensation will be vigorously met by appropriate doses of digitalis. Quinidine should be reserved for the control of paroxysmal tachycardia and auricular fibrillation (in the absence of cardiac decompensation, thrombosis or embolism, long duration of the latter arrhythmia, marked sclerosis or valvulitis, and cinchonism). Its rapid action and elimination indicate the necessity for short intervals of administration.

THYROTOXICOSIS

The patient with thyrotoxicosis requires special attention in the preparation for and the recovery from surgery. The protection of the mycardium dictates the peculiar requirements of this patient for glucose and oxygen (and perhaps insulin) in addition to the usual iodine-sedative-rest-high caloric diet preparatory course. Paroxysmal auricular fibrillation is particularly responsive to quinidine. It is wise to remove this handicap pre-operatively, although some argue that surgery will promptly resolve the arrhythmia. Where such is not the case, the patient usually has a stormy post-operative period. A logical schedule for the administration of quinidine sulfate follows: A trial period of four doses of 2 grains each at 2-hourly intervals. If no adverse symptoms develop, the individual dose is increased to 4 grains. This dosage is continued at 2-hourly interval *day and night* for 36 hours or until the rhythm returns to normal (if before this time). If no advantage is obtained in this period, no further continuance will avail. The maintenance dosage is fixed by gradual withdrawal. The individual dose is first reduced and then the interval steadily lengthened. The more fortunate patients may be able to get along without quinidine. Others require a certain amount over an indefinite period of time. The tachycardia of thyrotoxicosis is an inviting therapeutic target; but experience has shown that it responds very poorly to digitalis. Indeed, digitalis may lead to serious difficulties in limiting the minute volume output of the heart by reducing its size as it decreases its

rate.[7] Thevetin, on the other hand, appears to have an almost specific indication in this situation.[8]

Special problems are presented in cardio-vascular patients with gout, nephritis, diabetes, chronic gall bladder disease and urinary tract obstruction confronted with surgery. However, the sound physiological principles already outlined apply with particular force under these complicated conditions. Surgery in such patients presupposes as complete control of the underlying condition as circumstances permit.

SHOCK

Surgical shock has been reduced to its last common denominator on the basis of a decrease in the effective circulatory volume.[9] Many circumstances contribute to this condition. Trauma, blood loss, fluid loss, pain, acidosis and exposure are etiological factors. Recent studies[10] indicate that blood concentration anticipates the significant fall in arterial blood pressure. Hematocrit, hemoblogin and blood specific gravity determinations assume new values as indices of impending danger. Electrolyte disturbances have found expression in the suggestion of a potassium imbalance in shock.[11] The control of shock involves a close coordination of many factors. In response to a question relative to the prophylaxis of traumatic shock in France (1918) Professor Cannon said, "If I were expecting to be shot, I should like to have an ample bodily store of carbohydrates and fluids. I would then take morphine, alkalies and more fluids. I would like to have assured body warmth to avoid temperature loss and early hemostasis to obviate blood loss." This statement covers most of the requirements of the case except the restoration of blood and fluid loss through transfusions or infusions. The prophylactic and therapeutic utility of adrenal cortical hormone depends upon the restoration of the potassium-sodium equilibrium, and, in turn, a proper fluid balance.[11]

EMBOLISM

Post-operative thrombosis and embolism are very important surgical problems. The long period of inactivity incident to operative procedure, coupled with trauma and infection, prepare the field for thrombosis. Tissue respect, earlier mobilization of the extremities and thyroidea sicca offer some measure of protection against thrombosis. The same avoidance of manipulation and trauma in sites of possible or known thrombosis will reduce the incidence of remote embolism. The recent revival of the interest in heparin[12] for prophylaxis against thrombosis or against the propagation of the same affords a potent, but involved, weapon. The careful check of the clotting time of the blood requires the continued attention of a trained technician, if not a physician. (The clotting time must not be permitted to fall below 12 to 15 minutes.)

COMMENT

Through this consideration of the protection of the circulation in surgery runs the thread of the preservation or the restoration of the physiologic balance in the most complete degree possible. In affording the patient every possible support the surgeon is in no sense released from his moral pledge to minimize trauma and to respect tissues. The circulatory organs suffer from blood loss and shock as do the remaining organs of the body. It, therefore, behooves us to prevent, or, failing of this ideal, to treat shock as expeditiously as possible. The duration of the surgical procedure bears a direct relation to the incidence of circulatory complications. This circumstance will spur the lagging surgeon to higher efficiency. By the terms of protection the avoidance of circulatory complications offers a far worthier objective than their treatment.

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Eye Conditions of Interest to the General Physician

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IT IS quite beyond the realms of human possibilities for a general physician to be able to properly diagnose and treat all eye infections and at the same time be expected to keep up with all the new phases of diagnosis and treatment in general diseases that are continually being brought out in this rapidly changing medical age.

What, then, is to be expected of the general practitioner concerning the diagnosis and treatment of eye diseases? Some physicians flatly refuse to even

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attempt a diagnosis or treatment of eye affections, while others go to the other extreme and attempt to treat all eye affections. This should be regulated by the locality in which the physician is practicing. If in a large city, where eye specialists are available, then most all patients with eye diseases should be sent to the specialist, but, on the other hand, if there is no specialist to be had without sending the patient a long distance, then the physician should attempt to diagnose and treat the more common eye disease.

Unfortunately, the laity is not as yet well informed on certain eye problems of great importance, but we, as eye specialists, must forgive them for this shortcoming, inasmuch as we are at fault for not having, long ago, informed them through publications, in lay journals and periodicals and through lectures on public platforms of these most vital problems.

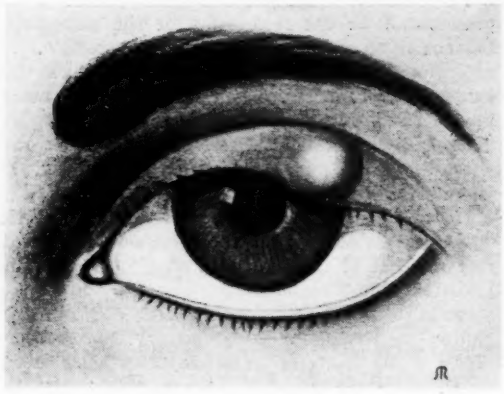

FIG. 1. CHALAZION

The chalazion is a cystic formation originating in one of the meibomian glands. It is slow in forming and usually causes no pain or discomfort.

Treatment: In early stage, gentle massage may abort the chalazion, but later, after it is well formed, it should be opened and the walls curretted away.

The most unfortunate circumstance of all is that many physicians are not yet properly informed on these self-same problems, and inasmuch as most patients go to the family physician for all information concerning health, it is, indeed, sad to relate that there are some few physicians who must need fall short in their information to the inquiring patient.

In the general consideration of the eye, it must be remembered that it is only one of the many organs that together constitute the great human system, and that many conditions or diseases affecting these united organs are in a measure mirrored in the eye, and while eye changes are not always of a nature to be detected, there are, however, changes in the eyes which become cardinal diagnostic signs in certain body affections and are of paramount value in the final diagnosis of that disease. For example: Choked disc in brain tumor, and the Argyle Robertson pupil, an early sign in tabes dorsallis. Besides, the importance of knowing the diagnostic value of certain eye conditions, there is value in the knowledge of the signs and symptoms of the severer as well as the minor types of eye affection.

In an attempt to present this subject in a brief and understandable manner it is necessary for me to break away from the conventional text book type of description and use, in a few instances, "short cuts" or changes in the common classification. This subject is so large that only those conditions which are most common, and some of the less common diseases and conditions of diagnostic value in general diseases will be discussed.

Lid Affections: Swelling of the lids often indicate some local affections and may also be a symptom of heart disease, nephritis, or due to an error of refraction.

The Conjunctiva: Swelling and congestion of the conjunctiva may be a sign of over-eating or alcoholism. It is present in hay fever, and may be allergic. It is often a symptom of errors of refraction or muscular imbalance.

Cornea: The cornea does not often show signs of general affections; however, a few instances are worth mentioning. Phlyctenular keratitis and conjunctivitis is indicative of constitutional errors. It occurs in debilitated and tuberculus patients, and in the so-called scrofulus diathesis.

Interstitial or parenchymatous keratitis is usually a sign of inherited syphilis.

Iris: Inflammation of the iris is often the result of focal infections such as abscessed teeth, infected tonsils and sinuses, gonorrheal urethritis and general infections as tuberculosis and syphilis.

Pupil: Much diagnostic information may be had by a careful examination of the pupils. While it is assumed that the diagnostic value of certain annomlies of the pupillary action is common knowledge to the general physician, it is thought that a

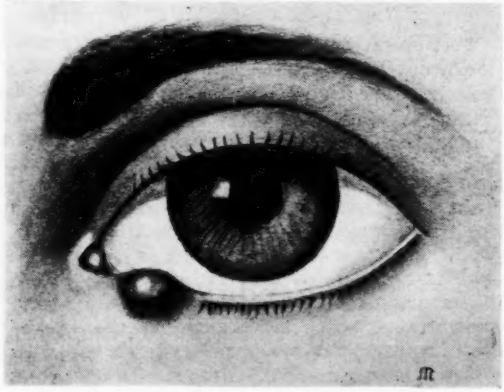

FIG. 2. HORDIOLUM

A localized infection of the gland of Zeis is due to eye strain, anemia, lowered state of health, and is associated with blepharitis. More common in children and young adults, but may occur at any age.

Treatment: In the early stage a sty may be aborted by removing the eye lash afflicted and applying hot applications. In the later stage, after the infection has been localized, incision and free drainage is the proper treatment.

short review of the pupillary reactions may be of value. The more common normal reactions of the pupils are that they are contracted in bright light, and dilated in subdued light. They also contract during the act of accommodation. When a light beam is directed into one eye the pupil will contract; also the pupil of the other eye will contract simultaneous with the lighted pupil (consenual reaction).

Another interesting phenomenon is that while the pupils contract as the retina is stimulated by light, the pupils will dilate if the tactile sense is stimulated, as pinching the skin. Also, the pupils contract when the optic axis converge in accommodation.

The two pupils are equal in size. It is quite rare to see unequal pupils in a normal person. The size of the pupils vary much in different people under the same conditions of illumination. The pupils are larger in youth than in old age. They are usually smaller in hypermetropia (far-sighted persons) than in the myopia (near-sighted persons). The normal size of the pupil may be said to be the result of the two reflexes spoken of above, the contraction to light and the dilitation to sensory stimulation.

Absence or changes in the above described reactions of the pupil are usually signs of diseases of the central nervous system. If the pupils do not contract when light is directed into them, but contract during the act of accommodation (Argyle Robertson pupil), degenerative diseases of the central nervous system is usually present, this being an early symptom of tabes dorsallis, and is present in about 70% of cases. It is also present in 50% of cases of general paralysis of the insane.

Contracted pupil may be due to the use of drugs (eserin, pilacorpin, etc.). It may also be due to bright light, cutaneous pain, iritis accommodation, paralysis of cervial sympathetic, etc.

Fixed or immovable pupils are the result of posterior synechea, iritis, absolute glaucoma, complete optic atrophy, atropine, etc.

Dilated active pupil may be due to glaucoma symplex, myopia, partial optic nerve atrophy, drugs (cocain, adrenalin, etc.), partial third nerve paralysis, certain types of blindness.

Inequality of pupil may be monocular synechea, syringomyelia, general paragysis of insane.

Irregularity of pupil, partial posterior synechea, senile atrophy of iris, general paralysis of insane and injury.

Nystagmus is a rapid oscillatory movement of the eyes. It may be congenital or infantile, and acquired. The former is due to congenitally malformed eyes, also eyes which have developed early opacities of the media. It is present in albinism, macular changes and some cases of total color-blindness.

Acquired nystagmus in adults is formed as a symptom of disseminated sclerosis, cerebellar disease, diseases of the vestibular tracts and semicircular canals. If the movements are horizontal and are seen only during extreme lateral rotations, it is indicative of the early stages of disseminated sclerosis, nystagmus movements of long excursions occur in cerebellar irritative lesions and are directed towards the side of the lesion. There is in

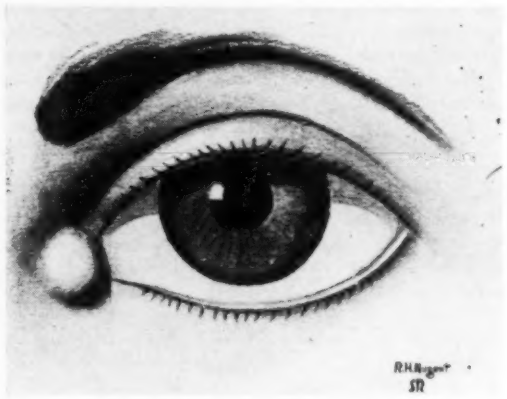

FIG. 3. DACRYOCYSTITIS

Chronic inflammation in the lacrimal sac is often present for months and years. It is usually due to a stoppage of the nasal duct.

Treatment: Consists of probing, syringing and removal of the sac or one of the other operations devised for its relief.

adults, also, an occupation neurosis, appearing in the form of nystagmus, as is seen in coal miners.

In congenital nystagmus, the patient is not aware of the movements, and the vision is usually defective. While in acquired adult nystagmus, the movements of the eyes often cause objects to appear to move and the vision may be normal.

Ophthalmoiplegia: If only a single muscle is paralyzed, it is usually the external rectus (sixth nerve paralysis) or the superior oblique (fourth nerve paralysis); if several muscles are affected at the same time it is indicative of third nerve paralysis. In case of paralysis of an ocular muscle there is usually diplopia or double vision. And in order to overcome the existing diplopia the patient usually turns the head so that the face is rotated toward the direction of action of the paralyzed muscle. "Ocular torticollis" is a term used to describe the turning of the head to compensate defective action due to the inactivity of one eye. It is a simple tilting of the head which contrasts it from true torticollis, in which tilting the head involves the rotation of the chin towards the opposite shoulder and a marked contraction of the sterno-cleido-mastoid muscle, is present.

Paralysis of ocular muscles are not of so great a diagnostic value as it may at first seem, as the nerve lesion may be situated most any place along the nerve tract from the cortex of the cerebrium to the muscle. Therefore, the lesion may be intra-cranial or intra-orbital.

The most common cause of ocular paralysis is syphilis, due to toxic swelling or gummatous growths most any place along the nerve trunk, other causes may be intra-cranial, such as hemorrhage,

thrombosis, or pressure due to tumors or peoriostitus.

Total ophthalmolplegia may be an early sign of encephalitis lethargica.

Synkinesis is an involuntary or reflex movement of a paralyzed part excited by a corresponding movement in a non-paralyzed part. Following are some diagnostic examples of synkinesis in the eyes.

Normally, when the eyes are turned upward the action is accomplished by the levator palpebrarum,

FIG. 4 INJECTION OF CONJUNCTIVAL VESSELS

Note that the vessels usually begin swelling at the periphera in or near the fornix and as the inflammation increases, the engorgement advances towards the cornea.

and in extreme upward rotation the frontalis is involved; pathologically, in congenital ptosis, the upward movement of the eyes is often defective. Normally, on looking down, the upper lid follows the globe; pathologically, in exophthalmic goiter, the lids do not follow the globe closely or not at all. This is known as Von Graefe's sign. In total facial paralysis the eye cannot be closed voluntarily; the lid, however will follow the globe on looking down; further, the eye will close during the action of other facial muscles, as in the act of laughing.

Asthenopia is a fatigue of the muscles of the eye which is attended by pain, headache and general discomfort. It is due to certain errors of refraction or muscular imbalance, and is corrected only by properly fitted lenses, muscle training, or the correction of existing constitutional disturbances.

Strabismus, or so-called "crossed eyes," is a condition which is far more serious than is generally believed by the average lay person. Usually only one eye is used for all visual purposes, while the other, being turned either "in" or "out," soon develops a condition known as suppression of vision. It, therefore, is not properly developed from a physiological standpoint, and the usual result is very poor vision in the crossed eyes. This incapacitates the individual to a greater or less degree and renders him unable to pass a visual test usually given by larger companies to the applicant for employment.

A word of warning here, therefore, is in order. These cases should be directed to an oculist just as soon as it has been discovered that a crossed eye exists, for in a very large percentage of cases the eye can be straightened and vision preserved in the crossed eye, by wearing properly fitted blasses, orthoptic training, and in some cases surgery. Early treatment will give a greater percentage of corrections with good vision and without the necessity of resorting to surgery.

The correction of strabismus by surgery is successful from a cosmetic standpoint in almost every case in which proper surgical methods and technique are used, but in a large percentage of these cases orthoptic training will be necessary to induce binocular co-ordination and bilateral single vision.

Myopia, or nearsightedness, is an error of refraction which is indicated by the absence of normal distant vision, but the patient may have normal vision for close work. It is easily corrected with properly fitted lenses, so that the patient can see far and near in the normal manner, but the fitting of lenses is not all that is necessary for the good of the patient's eyes. The patient who is usually quite young and attending school should be carefully examined for existing pathology and should be put in a perfect physical condition, if possible, for if allowed to go untreated a large percentage of myopia cases will progress and gradually become more marked. It is well to keep in mind that all school children suffering with errors of refraction should be carefully and properly refracted by a physician and properly fitted lenses prescribed and the patient instructed in the physiology of vision.

While we are discussing this subject a word about who should attend to the examination of the eyes is proper. It is apparent that many laymen and some physicians do not seem to appreciate the different services which can be rendered by an oculist and an optometrist. If the patient is referred to an oculist for his eye examination he will

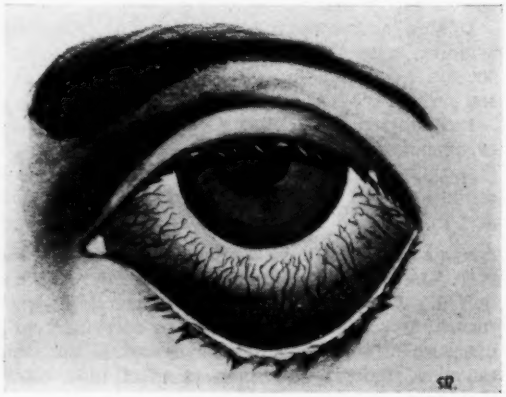

FIG. 5. ACUTE CATARRHAL CONJUNCTIVITIS

There is marked congestion in the fornix and on the palpebral conjunctiva. The Bulbar conjunctiva is not congested in the earlier stages or in the less severe types, but in the more severe infection the bulbar conjunctiva is congested as well. There is a muco-purulent discharge and much watering of the eyes. The prognosis is favorable.

be examined for existing pathological conditions, and if such be found the patient can be treated by the oculist, or if the pathology is present elsewhere in the body the patient can be returned to the physician for further examination and treatment. Whereas, if the patient is sent to a non-medical man, pathological conditions will be overlooked and the patient will be neglected and left to suffer for want of proper medical or surgical care.

In this day of advanced learning and greater exactness in living and personal hygiene, it is not in keeping with good procedure to treat patients in a shiftless or incompetent manner; therefore, specialists are of a necessity in some branches of medicine and surgery, and it so happens that the treatment of eye diseases and affections should be administered by the highest and best trained physicians and not by non-medical, so-called eyesight specialists.

Never before in the history of the human race has so much been expected of the eyes. Most of our newest and greatest inventions are intended to place more work on the human eye. The auto, the cinema, the increasing countless numbers of books, the voluminous array of periodicals now on the market, the great daily newspapers, also the artists and photographers add more work for the eye. The radio and telephone, being the only ones intended for the ear, are now having television added to furnish still more work for the eye.

Not only have we the added strain due to this great increase in ocular duty, but other complications have arisen. We have become a race of "sitters." We sit in our autos; we sit while we work; we sit at the radio; we sit in the "movies"; we get very little exercise; our daily walk is usually from the front door to the curb where our auto waits us. We eat too much. We overload our system with foodstuffs and because we are not active our organs become inert, and improper functioningg is the result. Naturally, the eyes receive their share of the damage.

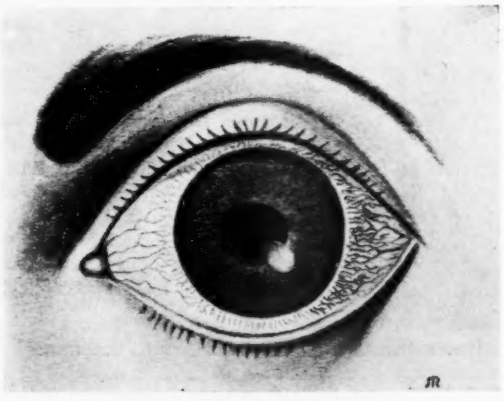

FIG. 6. SIMPLE CORNEAL ULCER

This is a common type of corneal affection. It is caused by trauma to the cornea, from the breaking down of phlyctenules, conjunctival inflammations, disturbed nutrition to cornea, etc. The simple ulcer usually heals without much delay; other ulcers, especially in the aged, are very resistant to treatment.

The proper use of an organ is its proper care; disuse invites decay. Misuse and abuse are unpardonable sins against the laws of hygeine. With reasonable care the eyes will do as much work or perhaps more than any other organ in the human system. But one cannot care for the eyes alone, for it calls for proper general body care and proper hygeine. If this is properly attended to, the eye problems will be very simple.

FIG. 7. CILIARY INJECTION

This is a net work of small vessels from the ciliary system and is immediately surrounding the cornea. It indicates inflammation of the iris, ciliary body and corneal stroma.

The Ophthalmoscope: Every physician, no matter what branch of medical practice he follows, should know how to use an ophthalmoscope. Space here does not permit a full treatise on the diagnostic information obtainable from a fundus examination. The choked disc of brain tumor, papilledema or papalitis of pressure or toxic origin; the exudative iritis of renal disease, commonly termed albuminuric retinitis; embolism of the central retinal artery due to mitral stenosis; choroditis due to syphilis; retinitis due to diabetes; hemorrhage of the retina occurring in most all forms of retinitis, and many other conditions of the retina are of valuable diagnostic value.

FIELD OF VISION

A record of the field of vision or what is commonly called the form field is of great diagnostic importance. In order to secure an accurate field, it is necessary to use a perimeter, and that the operator have some knowledge of the technic of taking the field. Scotometry is accomplished by using the tangent screen or the campimeter, giving records of greater diagnostic importance.

Any doctor who has a normal field of vision can get a good record of a patient's field of vision without the use of any of the above instruments. All he needs is a white card about 5 mm. square fastened to the end of an applicator with a piece of adhesive tape. Then, sitting 2 feet away facing his patient, with the patient's left eye and the doctor's

right eye occluded, he asks the patient to look into his left eye. While the eyes are thus fixed, the improvised target, consisting of the white card, is held out far to the doctor's right, and slowly advanced to a point half way between the doctor's and the patient's eye. The patient is instructed to tell the doctor the instant he sees the white card. This procedure is repeated in about eight meridians

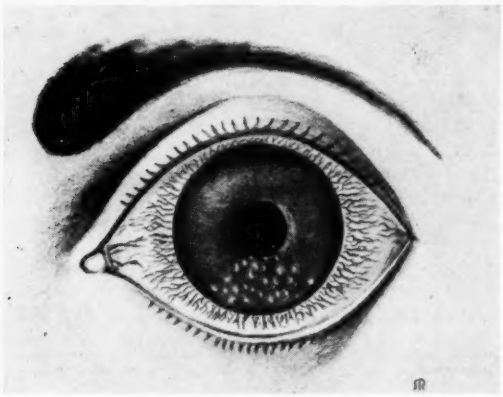

FIG. 8. SEROUS IRIDOCYCLITIS

Characteristic of intraocular inflammation, there is here shown a heavy circumcorneal injection. Added to the picture, is the not uncommon leucocytic deposits on the posterior surface of the cornea, the result of inflammation of the ciliary body. Iridocyclitis is usually the result of focal or general infection.

surrounding the eye. If the patient sees the card at about the same time the doctor sees it, it can be assumed that the patient's field of vision is normal.

CATARACT

Cataract is an opacity of some part or all of the crystalline lens. Babies are sometimes born with cataracts (congenital cataracts), but most often cataracts appear after birth (infantile cataracts). These are most often soft cataracts and should be removed. Cataracts are sometimes present in early adult life; in fact, they can come on at any age. The most common form of cataract is that type which comes on in patients past middle life, called senile cataract. There is, also, the traumatic cataract, which is due to injury.

All cataract patients should be sent to an oculist as soon as they are discovered, so that the patient may be guided by the oculist's advice.

In recent years much research work has been done in the method and manner of removing cataracts. This is classified into the extra-capsular and the intra-capsular methods. The former, known as the "classical" method, consists of the dividing of the capsule of the crystalline lens and expressing or washing out the lens contents. This is the older method. The later method consists of removal of the lens in toto, in which case the so-called "after cataract" is impossible. This is the newer method, and requires more experience to perform it correctly, and on the whole gives better results in the hands of those who have had experience with both methods.

INDICATIONS FOR HOT AND COLD APPLIED TO THE EYE

It is common knowledge that metabolism is best maintained at normal body temperature; is accelerated by the use of heat and retarded by the application of cold.

The comparative action of heat and cold on the eye makes it imperative that heat be used in all cases where metabolism is to be kept at its best—and that applies to all eye affections, with but few exceptions.

When cold applications are used on the eyes, it is usually a case of choosing the lesser of two evils. For example, in case of injury, cold compresses can be used to prevent blood extravasation into the tissues, and then they should be used only for a short time, or until the danger of bleeding has passed. In this case, therefore, the damage done to the cornea and other delicate structures would not be so great as that which might result from the hemorrhage.

In brief, hot applications are best used in all eye affections, with the exception of injuries where there is no laceration of the skin and there is danger of discoloration due to extravasation of blood or of swelling due to lymph stasis in the injured parts, in which case it is more beneficial to use cold applications for the first few hours, then heat from that time until the parts have returned to normal.

231 W. Washington St.

Refraction and Muscle Balance in Aviation

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THE ever increasing complexity of the unnatural task of piloting a heavier than air mechanism demands a good deal more of its practitioners than a good sense of "balance in the pants" Good, balanced vision is of primary importance. With the constant advances in night and instrument flying there must be a ready dark adaptability. Of this function Ferree and Rand say[1] "The night flyer needs especially the power to change his vision quickly from the illuminated cock-pit and instrument panel to the outside world and back again. Normal, or better than normal sensitivity in light adaptation, is, of course, also important." So, mere good vision, as the term is generally understood, is not enough to require of the pilot. It is imperative that a pilot's eyes must do these services for him:

(1) See things at a distance, (2) judge how far away they are, (3) see nearby objects, such as his instrument panel.[2] In order to establish the fitness of the eyes to perform these services certain valuable tests have been devised. The eyes of the prospective pilot must measure up to a minimum standard, now well established by long experience. Unless these standards are met, the pilot is a potential source of danger to himself, his fellows, and to valuable equipment.

REFRACTION

It was established long ago that a majority of accidents was due to man or pilot failure rather than to machine failure. Further investigation showed that many cases of pilot failure could be traced to sub-standard visual acuity. It was a logical step on the part of the armed services to prescribe a complete refraction of the eyes, under cycloplegia. Perhaps the most important part of the present required examination of prospective pilots is the refraction. The records of March Field (U. S. Army), in a recent study of 500 rejected applicants[3], show that 62.2% of the cases rejected were disqualified because of eye defects. More than one-half of this group were rejected because of errors of refraction. Gore and Lawton[4], in a report of 575 examinees rejected at Maxwell Field (U. S. Army), found a high percentage of disqualifying errors of refraction. One hundred and ninety-three candidates were eliminated because of poor vision. Brown states[5], from 19 years experience in the U. S. Army Air Corps, "that more candidates are disqualified for poor visual acuity than any other reason; next, ocular muscle imbalance and defective depth perception; many for Cardio-vascular instability; neuropsychic examination; and finally flying adaptability test." Ocular requirements do not demand supermen, arbitrary though the standards may appear. These requirements are based on the minimum limits judged by ophthalmologists to be compatible with safety. True, one famous aviator became very proficient in his flying, using but one eye. But he was one among a million. Which is to say that trouble is almost sure to follow if a pilot with sub-standard ocular equipment is allowed to fly. The standards for Naval Aviators are somewhat higher than those of Department of Commerce licensees. Ickstadt[6] says "In the Navy, in passing a candidate for aviation training, not only his present physical findings must be considered, but also the probable length of time they will remain within qualifying limits. Because of the exhaustiveness of the course and the cost thereof, it is not sufficient for the graduate to remain fit for one or two years. He must maintain his efficiency for 10 or 12 years to make the investment a paying proposition to the Government. Hence it is evident that our present standards were devised, not particularly for the purpose of deciding who should be able to learn to fly, but rather with an eye to the probable length of a pilot's usefulness in military flying."

In the Navy an examinee is disqualified if he cannot read 20/20 without more than one diopter of correction, either hyperopic, myopic or astigmatic[7]. Flying, especially at high altitude, places a high degree of strain on the physique of the pilot. The eyes are in constant hard use, with an accompanying knowledge on the part of the pilot that his very life may depend on their perfect response and behavior at all times when it is in the air. Fatigue of the entire body as well as the eyes may build up rapidly. As Chase[8] has said: "An eye with latent hyperopia (of more than one diopter) will quickly tire and fail to see maps and instruments correctly, especially since accommodation is greatly diminished in the low oxygen of high altitude, and because the effort to focus the ray of light on the retina is apt to induce a tonic action of the Ciliary muscle of accommodation, as well as the internal recti muscles which turn the eyes in when viewing objects at close range. This tonic action produces errors of distance judgment and leads to crashes in landings."

The flight surgeon is well aware of the reasons for the ocular standards as now prescribed for the applicant for flying training. Certainly part of his duty must be to thoroughly and sympathetically explain these reasons to the candidate who may question, and to other interested parties who may criticize and even at times, quarrel with the standards prescribed.

MUSCLE BALANCE

Coordinated functioning of the eyes is nearly as important to the Aviator as visual acuity. According to Wilmer[9] "otherwise there is a progressive loss of muscle tone as the pilot ascends, resulting in a restricted field of binocular fixation, double vision, and loss of accommodation. Under such conditions there would be difficulty in perceiving and placing an enemy machine and in seeing accurately the barograph, air speed indicator, revolution counter, compass, inclinometer, drift meter and the numerous other instruments under the eye during flight." The flyer with esophoria may judge the ground to be farther away than it really is. He is apt to crash by running the nose of the plane into the ground. The pilot with exophoria may level his plane too soon on attempting to land. He thinks the ground is closer than it really is. The plane may stall and crash. Hyperphoria leads to very serious errors in judgment of distance. The pilot with a heterophoria of any type may at one time be too high in his landing approaches, and at another time be too low. He may do this by over compensating for the previous error.

Tests for heterophoria as now used in the Navy are (1) Maddox-rod Screen tests at 6 meters, (2) Maddox-rod Screen test at 33 centimeters (3) prism divergence, (4) test of associated parallel movements, (5) depth perception at 6 meters.

The amount or degree of heterophoria may vary in the same individual rather widely. This variance depends in great part of fatigue. Therefore, the pilot with even a slight amount of heterophoria on the ground may well acquire a danger-

ously high degree of ocular imbalance when in the air and under a considerable amount of fatigue. Thus this flyer may make unsteady landings, may crash.

COMMENT

Good visual acuity is perhaps the most valuable single asset an aviator may have. The flight surgeon must understandingly and strictly apply the prescribed tests in order to determine the presence or lack of normal visual acuity in the candidate for flying. Good balance of the extra-ocular muscles is nearly as necessary to the flyer as normal vision. The flight surgeon must accept much of the responsibility in the selection of aviation trainees and in their care after graduation. He must be thoroughly aware of the physical standards demanded of the pilots, and must strictly apply them. In so doing he discharges a high duty to the individual, his fellows, and the Government. Without the flight surgeon's intelligent cooperation, the art of flying could hardly be highly developed as it is today.

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Pathology of Lymphoblastoma

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THE term "lymphoblastoma" is used in a generic sense to name a group of conditions which have in common the property of being neoplastic proliferations of lymphocytes. There are several distinct species of tumors in this genus which will be described.

These tumors are as difficult to diagnose and classify as any other group of conditions with which the pathologist has to deal. He encounters difficulties in diagnosis for several reasons, the most important of which is that he is often presented with totally inadequate material for study. An intact non-traumatized lymphnode is essential. Prompt and proper fixation of the tissue are equally important and the microscopic sections must be of high quality to permit an adequate study. A second difficulty is due to inadequate information furnished him concerning the clinical course of the disease. The pathologist must take into consideration the history of the disease and often the correct diagnosis can be made only after carefully weighing the information from all sources; history, physical examination, radiologic study, clinical laboratory tests and biopsy. To deny the pathologist clinical information often defeats the purpose of biopsy resulting in inadequate or incorrect diagnosis.

The lack of standards in diagnosis and classification of these diseases has lead to confusion between clinicians, pathologists and radiologists. When lymphnodes, bone marrow or parenchymatous organs are involved by a tumor process the symptoms and signs which the clinician observes are caused by the impaired function of the structures. The pathological entity is only defined by determining the cell giving rise to the involvement. The response to irradiation therapy is the radiologist's yard stick of classification. In spite of the difficulties encountered it is of paramount importance to the patient that the nature of the condition be correctly identified. The earlier this is done the greater are his chances of having a prolonged and more comfortable life through the use of irradiation therapy. Efforts should, therefore, be made towards standardization of classification and mutual understanding of these diseases. In the following paragraphs the fundamental nature of lymphoblastoma is presented.

In the analysis of proliferative processes in general the lesions are separated into two great groups. Here the proliferation is reactive and due to a more or less definitely known injurious agent. The proliferation occurs in an orderly fashion usually patterned after the original tissue and is under the influence of some controlling mechanism which orders a halt when a sufficient amount of new tissue has been formed. Contrasted with this is the second great group of proliferative lesions which are called neoplasms. They are defined as autonomous tissue proliferations of unknown etiology which are not under control of any body mechanism and serve no useful purpose. Since neoplasms are without known cause some other basis of classification must be employed and the most satisfactory substitution is a division based on the type cell which is proliferating. At present our interest concerns only the lymphocyte and its neoplasms, the lymphoblastomas.

Normal growth of the lymphocyte results in the formation of both fixed and circulating tissues. Reactive hyperplasia may produce lymphocytosis in the blood or local lymphocytic accumulations. It is expected that the noeplastic proliferations of the lymphocyte should show a similar distribution

(localized and circulating). The blood forming tissues of the entire body form a continuity that is unlike that of any other tissue, and it becomes necessary to consider the lymphoid tissue, reticuloendothelial tissue, myeloid tissue, etc., distributed throughout the entire body as continuous systems with a circulating fluid stroma. The connection of one part of the system with another is, therefore, very intimate. Neoplastic proliferations of the lymphocytes may remain within the lymphoid system for a long time, spreading from one focus to another and one lymphnode group to another before extending beyond its borders. Other forms may quickly invade adjacent tissues and metastasize to areas outside the lymphoid system, exhibiting malignancy from the onset. On the basis of these properties lymphoblastoma may be classified as follows:

1. Leucemic.
2. Aleucemic.
3. Sarcomatous.

1. Leucemic lymphoma (lymphatic leucemia).

Lymphocytes are present within the circulating blood in greatly increased numbers and a blood count of 25,000 has arbitrarily been set as the lower limit of leucemia. Although the blood findings may be the most conspicuous part of the clinical picture, proliferation of lymphocytes in fixed tissues of the lymphnodes, spleen, bone marrow and liver form the important underlying basis of the disease. Sooner or later these foci of neoplasia become clinically manifest and very bulky tumors may be formed. The course of the disease may be acute or chronic, lasting from a few weeks to 10 to 12 years, but fundamentally the disease process is the same. Leucemia may exist early in the course of lymphoblastoma and persist throughout its natural history. At other times it appears later either spontaneously or after irradiation therapy, or may be present early and then disappear. Leucemia sometimes terminates in frank sarcoma with local tissue invasion producing massive tumors.

The neoplastic cells in leucemic lymphoma vary from fully mature small lymphocytes in chronic cases to larger lymphoblastic stem cells in the acute forms. The affected lymphnodes show an increase in size of primary nodules due to proliferation of lymphocytes. With progress the nodules become confluent and the node becomes a homogeneous mass of lymphocytes with the normal architecture completely obliterated. There is very little change in the reticular supporting tissue. The lymphnode enlargement is usually quite generalized, although a focus of more marked involvement is often present. In the spleen the lymphoid Malpighian nodules become enlarged, encroaching upon the red pulp, often obliterating it. In the liver the portal areas are enlarged by nodules of lymphocytes which may also infiltrate between the liver cords. In bone marrow and other organs diffuse infiltrations may occur but appear to be proliferations starting in pre-existing lymphoid collections.

2. Aleucemic Lymphoma.

Neoplastic proliferation of lymphocytes not associated with leucemia assume two different anatomical forms:

(a) Diffuse Aleucemia Lymphoma (pseudoleucemia).

The lymphnode tumors tend to be less generalized and there is usually a focus of greatest intensity. Histologically the process in the lymphnodes is the same as in the leucemic form and a biopsied lymphnode does not differentiate leucemia and aleucemia. The liver and spleen may participate in the process. Although the number of lymphocytes in the blood is not increased, immature forms are always present and may be found if careful search of blood smears is made. Frank leucemia often develops terminally in these cases and sometimes after irradiation therapy. The clinical course is the same as in leucemic lymphoma.

(b) Nodular Aleucemia Lymphoma (Giant follicle hyperplasia Brill-Symmers Disease).

All lymphnodes throughout the body may be enlarged although initially the disease may have distinct regional characteristics. Early the lymphnodes become enormously enlarged due to the formation of numerous nodules resembling large germinal centers. This produces the characteristic nodular appearance which is unlike other forms of lymphoma. The spleen is almost always invloved and may be markedly enlarged due to enormous Malpighian nodules.

The clinical course is usually chronic and the duration of life is considerably longer than in ordinary cases of lymphoma. The condition is very sensitive to irradiation and superficial nodes well irradiated usually promptly disappear and may never swell again. In the early localized stage of the disease adequate treatment may be curative.

3. Sarcomatous Lymphoma (Lymphosarcoma).

(a) Lymphocytic neoplasia may begin focally at any point within the lymphoid system, exhibit rapid and invasive growth and metastasize to locations outside this system. This process is frankly sarcomatous from the beginning and continues as a typical malignancy. Primary sites are located in lymphnodes, adenoid tissue, stomach, intestinal tract and bone marrow. Histologically the tumor tissue is made up of immature lymphocytic cells and the more atypical the cell the more malignant is the tumor. Typically there are no abnormal findings in the blood but in rare cases the sarcomatous process may become leucemic.

These neoplasms are likewise highly radiosensitive but since they metastasize early the chances of cure are markedly reduced.

(b) Lymphocytic neoplasia of the leucemic or aleucemic forms described above may after a prolonged period of growth within the lymphoid system, assume more rapid growth, become invasive and metastasize. Terminally they are truly sarcomatous.

This entire group of conditions which have been termed lymphatic leucemia, pseudoleucemia, giant follicle hyperplasia, lymphosarcoma, etc., would,

therefore, seem to form a continuous group. All are neoplastic proliferations of the lymphocyte. The clinical and anatomical types are dependent upon variations in rapidity of growth and degree of differentiation of the tumor cells, no different than other forms of malignant disease. The mobile nature of the tissue, however, permits a greater diffusion of the neoplasm through the involved system than occurs in other forms of neoplasms.

The lymphoblastomas form the most definite entities of the various neoplastic diseases of the blood forming tissues. Neoplasms of the other leucocytes —myeloid cell (myeloblastoma) and reticulum cell (reticulo-blastoma and Hodgkins Disease) will be considered at another time.

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Epidemic Encephalitis

(Report of a Sporadic Case)

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IN PIMA COUNTY, Arizona, no case of encephalitis has been reported for at least the past seven years. The occurrence, therefore, of even a sporadic case of what would appear to be somewhat a typical form of the disease would appear to be worth reporting, especially in view of the increasing prominence which the condition has recently been attaining. It is unforunate that most neurological texts of my acquaintance emphasize the difficulty of early diagnosis of sporadic cases rather than offering any help in recognition, and they are uniformly uninformative concerning therapy, early or late.

REPORT OF CASE

The patient, a 34-year-old white male whose ordinary occupation had been that of a salesman, but who had up to two or three weeks prior to his initial examination been working on a farm near Tucson, was seen for the first time on January 22 of this year with the complaint of moderate weakness in both shoulders, arms and hands, and the right leg, together with a sensation of soreness or itching and burning on pressure over the shoulder girdle. These symptoms had begun some ten days before, at which time he had noticed a slight stiffness of the neck and the onset of the soreness of the shoulders, which formed one of his main presenting complaints. The weakness in his arms had begun very suddenly on the morning of January 12, 1940, when on arising he became aware of a slight clumsiness in handling various objects. The weakness and shoulder discomfort continued to become progressively worse up to the date on which he presented himself for examination.

His past history was negative save for a mild sinusitis and a mild bronchitis, both of long standing. He had come to Arizona in October of 1939 though not for his health, and since that time the sinus and bronchial disorders had steadily diminished. Close inquiry, however, revealed the fact that he had had a cold of moderate severity about a month before the onset of symptoms; he did not know whether he had had any fever at that time or not, but he was unable to work only for a day, whereupon he returned to his job of farm laborer. As an aside, it is worthy to note that he had had no contact of any sort with horses while doing farm work, nor were there any sick horses on the farm on which he was employed during the time he remained there, which covered a period of about three months.

Read before the Pima County Medical Society, February 13th, 1940.

Physical examination revealed a slight, well-developed and well-nourished white male, afebrile, and weighing 137 pounds stripped. The sinuses were normal to transillumination and pressure pupils round and reactive to light and accommodation, the fundi and extrinsic ocular muscles normal. The teeth were in moderate need of repair, dental hygiene only fair. Examination of the heart, lungs, abdomen and genitalia were quite negative. The blood pressure was 130/82-80 on exertion, rapidly falling to 106/76-66 on rest. Rectal examination revealed a slight but definite relaxation of the sphincter ani and a slight induration of the right lobe of the prostate, without tenderness.

Neuurological examination revealed no stiffness of the neck, or Kernig's sign; deep reflexes with the exception of the right biceps jerk, which was completely absent, were slightly exaggerated; abdominals absent; cremasterics sluggish and obtainable on the right side only. There were no seasony disturbances save for a slight uncertainty in the finger to finger to test. The Romberg was negative.

Routine laboratory examinations on the same day and the day following revealed a negative blood Kahn; a normal urine, 5,490,000 RBC, with a Hb of 14 gms. by the Haden Hausser method; the WBC was 6,700, and the differential showed 48% segmented pmn's, 1% non-segmented pmn's, 42% lymphocyctes, 4% monocytes, and 5% eosinophiles. The sedimentation rate was 2.5 in 60 minutes.

On the night of January 22, the patient noticed a slight difficulty in starting the urinary stream; a slight difficulty as well in defacation, stating that he felt that he did not have enough strength in his abdominal muscles to move his bowels; it was, in fact, necessary for him to resort to a cathartic at this time, a thing he had rarely done in the past.

On the basis of these findings, a tentative diagnosis of encephalitis was made, and the patient hospitalized for observation.

Observation consisted mainly of a single lumbar puncture, after which the patient, being in severe financial difficulty, which had led to the more than casual entertainment of the thought that he might be hysterical, was permitted to return home. The results of the lumbar puncture, however, removed thoughts that the disturbance might be on a psychic basis; the fluid flowed freely, though slowly, and the Queckenstadt test was positive. The clearness of the spinal fluid, which appeared entirely normal, militates against the thought of a blockage; nevertheless, only about 5 cc. could be withdrawn before the flow became so slow as al-

most to stop completely. The Pandy was negative, but the Ross-Jones globulin test was 1 plus; the cell count was 13, 68% lymphocytes and 32% polymorphonuclears. The spinal fluid Wassermann was negative; the Lange gold curve gave a good reading of 11223320000, which was interpreted as being definitely abnormal, though only weakly so. The lack of sufficient quantity of fluid prevented the doing of either a pellicle formation or tryptophane test, nor was there enough to have allowed the performance of a spinal fluid sugar, the results of which would have been of interest.

The patient returned to work for about a day after leaving the hospital, after which his progress downhill towards complete invalidism was extremely rapid. The paresis which was his original complaint developed into a definite flaccid quadriplegia; the reflexes, however, with the exception of the right biceps jerk, which remained absent, continuing to be somewhat hyperactive. A prick by a hypodermic needle, used in giving thiamine chloride on half a dozen occasions (therapy which, incidentally, was without any noticeable effect, either subjective or objective) caused marked tonic contractions of the arm, and now and then there could be seen fibrillatory quivering of the various voluntary muscles.

The patient continued in this state for about a week, though the discomfort in the shoulder girdle seemed to him to have got less, when there was fleeting return of the abdominal reflexes. They were, however, present on one occasion only, and were quickly fatigued to the point of extinction. The day following the return of the superficial reflexes, the paralysis of the lower limbs began to take on a spastic quality, and the patient's wife stated that it sometimes took her as long as 15 minutes to straighten out his legs after he had been sleeping. After being awake a time, flaccidity returned. This form of spasticity gradually spread to involve the arms, and on February 10 distinct patellar clonus was present, while on February 12 ankle clonus elicited.

At about the same time as the onset of the periods of spasticity, the patient stated in response to a direct question that he was becoming unsure of the position of his hands or feet occasionally, a fact confirmed by examination done at that time, when it was also found that the Babinski had become suggestively positive bilaterally and there was a beginning hyesthesia of both hands and forearms. The Babinski later became strongly positive and the hyesthesia a definite anaesthesia of the forearms and back of the hands. The cremasteric reflexes also disappeared.

One further development which might have been considered to have had an ominous prognostic significance occurred during the week of February 4. The patient began to complain of distinct difficulty of breathing on occasion, and there was a definite sternocleidomastoid type of respiration required each time the patient exerted himself to the extent of trying to speak over any extended period. The chest moved very little with respiration. The impression, however, continued to be that his difficulty arose from a disturbance of his intercostals, either with or without a concomitant diaphragmatic disturbance rather than from a bulbar involvement, since he did not complain of trouble in swallowing, though it was an effort for him to clear his throat of mucus on awakening in the morning. There was a slow gradual return of muscle function over the following month, but co-ordination has continued poor.

At no time was there any mental involvement whatsoever, and the patient's mental outlook remained almost unbelieveably good throughout a very trying period.

COMMENT

Von Economo treats of several types of encephalitis, the three commonest forms being the somnolent ophthalmoplegic type, in which there are marked disturbances of the sleep cycle and derangements of vision, such as diplopia; the hyperkinetic type, in which the presence of various sorts of delirium, so-called "derailment of action," in which an act is begun but not completed, choreiform movements and similar symptoms are most in evidence; and the amyostatic-akinetic type, which is the form oftenest seen as a chronic state, that is, a Parkinsonism. In addition to these classes, a few others, less common, are noted by Von Economo; namely a pseudo-tabetic form, a psychotic form, and a monosymptomatic form, in which last group falls epidemic hiccough, probably. Clearly, the case here presented cannot be put wholly into any of these pigeon holes; it is, however, worthy of note that atypical forms of encephalitis are common enough, and there have been more facts in this case, even from the beginning, suggesting encephalitis rather than any other diagnosis. Further, Wechsler states that any disturbance in which there is present a combined pyramidal and extrapyramidal lesion can be diagnosed in retrospect as having been, in all likelihood, encephalitis. This late conclusion, unfortunately, does the patient no good whatever. Equally unfortunately, even a diagnosis made in the earliest stages of the disease seems to have value only academically, and to the physician rather than the patient; recommendations concerning abortive or curative therapy being non-existent.

One final remark is probably in order; that is the question of the propriety of calling such a condition as the "epidemic" when the probability is that the disease is not even contagious, as witness the fact that the patient shared a bed with his wife during the entire course of his illness, both after frank symptoms and throughout the period of prodromal symptoms, and that she remained in very close contact with him at all times; yet she continued to be altogether well. Indeed, Wechsler remarks that the contagiousness of the disease is so slight, if it can even be considered to exist at all, that cases of more than one victim of the illness in a family must be considered rather happenstance than evidence of contagion. Yet it is hard to know what to call this since the etiology is still rather vague; and much as there are sporadic cases of meningococcus meningitis—or epidemic meningitis, if you will—so, perhaps, there is justification for referring to instances of the sort reported here as occurrence of sporadic cases of epidemic encephalitis until a better term is devised.

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Since submitting this case, reports on the blood serum examinations by the Hooper Foundation have been received. The serum failed to give reactions diagnostic for either the St. Louis or equine forms of encephalitis.

The Significance of Convulsions

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Los Angeles, California

CONVULSION has been described as "a violent and unnatural contraction of muscles," and broadly considered may be assumed to indicate a disordered condition of the central nervous system. The occurrence of a violent, generalized, epileptiform convulsion is most dramatic and awe-inspiring, and has commanded the attention of the laity as well as medical men throughout the ages. It is natural that the ancients, lacking a knowledge of anatomy and physiology, interpreted convulsions with superstition and ascribed their incidence to divine influence or to the possession of the body by evil spirits. Hippocrates (460 to 370 B.C.) was the first to recognize that epilepsy is due to natural and not divine nor demoniacal influences, and that some disturbance in the brain must be the explanation of its manifestations. His dissertation, "On the Sacred Disease," was a powerful argument against the then current superstitious beliefs in regard to epilepsy, and represents a conception of the functions and derangements of the brain centuries ahead of his time. It may be of interest to quote some extracts from this work of "The Father of Medicine."

"It is thus with regard to the disease called sacred; it appears to me to be no wise more divine nor more sacred than other diseases, but has a natural cause from which it originates like other affections. Men regard its nature and cause as divine from ignorance and wonder, because it is not at all like to other diseases. And this notion of its divinity is kept up by their inability to comprehend it . . . they who first referred this disease to the gods appear to me to have been just such persons as the conjurers, purificators, mountebanks and charlatans now are, who give themselves out for being excessively religious and as knowing more than other people . . . For, if they imitate a goat, or grind their teeth, or if their right side be convulsed, they say the mother of the gods is the cause. Or if any excrement be passed, which is often the case, owing to the violence of the disease, the appellation of Enodius is adhibited! . . . But if foam be emitted by the mouth, and the patient kick with his feet, Ares gets the blame. But terrors which happen during the night, and fevers, and delirium, and jumpings out of bed, and frightful apparitions, and fleeing away, all these they hold to be the plots of Hecate, and the invasions of the Heroes. . . . But in them, the brain is the cause of this affection, as it is of other very great diseases. . . . The brain of man, as in all other animals, is double, and a thin membrane divides it through the middle, and therefore the pain is not always in the same part of the head; for sometimes it is situated on either side. . . . This disease, then, affects phlegmatic persons, but not bilious. It begins to be formed while the foetus is still in utero. For the brain, like the other organs, is depurated and grows before birth. . . . And if the defluxions be more condensed, the epileptic attacks will be more frequent. . . . (in the attack). The patient loses his speech, and chokes, and foam is issued by the mouth, the teeth are fixed, the hands are contracted, the eyes distorted, he becomes insensible, and in some cases the bowels are evacuated, and these symptoms occur sometimes on the left side, sometimes on the right, and sometimes in both.

"For the brain becomes more humid than natural, and is inundated with phlegm, and becomes wet and humid. This you may ascertain in particular, from beasts of the flock which are seized with this disease, and more especially goats, for they are most frequently attacked with it. If you will cut open the head, you will find the brain humid, full of sweat, and having a bad smell. And in this way truly you may see that it is not god that injures the body, but disease. And so it is in man.

"And men ought to know that from nothing else but from the brain comes joys, delights, laughter and sports, and sorrows, griefs, despondency and lamentations. And by this in an especial manner, we acquire wisdom and knowledge, and see and hear, and know what are foul and what are fair, what are bad and what are good, what are sweet, and what are unsavory; some we discriminate by habit, and some we perceive by their utility . . . . And by the same organ we become mad and delirious, and fears and terrors assail us, some by night, and some by day, and dreams and untimely wanderings, and cares that are not suitable, and ignorance of present circumstances . . . . all these things we endure from the brain, when it is not healthy, but more hot, more cold, more moist, or more dry than natural, or when it suffers any other preternatural and unusual affection . . . In these ways I am of opinion that the brain exercises the greatest power in the man . . . and the eyes, the ears, the tongue and the feet, administer such things as the brain cogitates. . . . It is the brain which is the messenger to the understanding. . . . And the disease called Sacred arises from causes as the others, namely, those things which enter and quit the body, such as cold, the sun, and the winds, which are ever changing and are never at rest."

And again in his discussion of surgical operations on the cranium in the treatment of injuries of the head: "Incisions may be practiced with impunity on other parts of the head, with the exception of the temple and the parts above it, in which region an incision is not to be made. For convulsions

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seize on a person who has been thus treated; and if the incision be on the left temple, the convulsions will seize on the right side; and if the incision be on the right side, the convulsions take place on the left side."

In considering the modern viewpoint of the significance of convulsions, it is essential to review some of the established facts of physiology of the nervous control of the voluntary muscular system, since it is the voluntary, or striped, muscles which are predominately involved in convulsions.

The physiological contraction of voluntary muscles is dependent upon nerve impulses which ultimately reach the muscles via the lower motor neurons. Normal movements are effected by a harmonized, or patterned, distribution of multiple nerve impulses so organized as to produce co-ordinated and purposeful or useful results. The source of nervous impulses which cause motion may be at various levels of integration in the central nervous system, *e. g.*, conscious, or willed, movements result from impulses which arise in the motor area of the cerebral cortex; automatic movements, as respiration, from impulses arising in the medulla; and reflex movements, from impulses excited in the various reflex centers in the brain stem and spinal cord. In each case the patterning and distribution of the impulses is appropriate to effect the physiological movement.

In contrast to normal movements, convulsions are more or less violent and inco-ordinated contractions of groups of muscles, and are caused by what might be called showers or avalanches of nervous impulses which overflow the limits of normal physiological patterns. They represent the irritative, in contrast to the paralytic, effect of pathological processes in the central nervous system, and the type of the convulsion varies with the anatomical level at which the irritating process occurs. With respect to the place of origin of the impulses causing their manifestations, the following types of convulsions may be mentioned: unilateral, or Jacksonian, convulsions, which result from irritations of the cerebral cortex; generalized, or epileptiform convulsions, from impulses probably released in the diencephalon and mesencephalon; myoclonic convulsions, which evidence indicates arise largely in the brain stem; cerebellar fits, which are more or less generalized tonic and clonic convulsions associated with lesions of the dentate nucleus of the cerebellum; torsion spasms, or writhing convulsive movements, associated with pathology of the extrapyramidal motor system; tonic spasmodic contractions of the lower extremities associated with lesions of the spinal cord; decerebrate rigidity from lesions of the midbrain; tetanic convulsions caused by tetanus and strychnine poisoning in which the neural synapses of the spinal cord are affected, lowering the threshold for the passage of impulses to the peripheral motor nerves. To the list should also be added the local and generalized convulsive movements of hysteria which are dramatic and at times violent in their manifestations, but in which the patterns of normal voluntary movements are utilized, and of which psychogenic factors are the cause. It may be useful to consider briefly the characteristc convulsive symptoms which result from lesions at different levels of the central nervous system.

In severe but incomplete lesions of the spinal cord above the lumbar enlargement, a hypertonic or spastic rigidity often occurs in the muscles supplied by spinal segments below the level of the lesion. With this spasticity is commonly associated a tendency to spasmodic flexion contractions of the lower extremities. These convulsive movements are essentially of the nature of withdrawal or defense movements. They are easily elicited by sensory stimuli, and although they often appear to occur spontaneously, they are probably always reflex in character, even when the stimulus is not apparent. When paraplegia is complete it is a striking phenomenon when the lower extremity is convulsively flexed at the ankle, knee and hip, and at times raised from the bed in response to a trifling stimulation.

Decerebrate rigidity, due to lesions of the midbrain and upper part of the brain-stem, is characterized by tonic rigidity of all of the extremities in extension. Decerebrate rigidity is produced experimentally in animals by section of the brainstem between the vestibular nuclei and the red nucleus. It represents a greatly exaggerated or spasmodic action of the anti-gravity muscles *i. e.*, the muscles which maintain the weight of the body against the force of gravity in order to maintain the erect position. This type of rigidity disappears when the vestibular nuclei are involved in the lesion.

Jacksonian epilepsy, or unilateral convulsions, result from lesions or local irritations of the motor areas of the cerebral cortex. They usually begin in the face, the arm or the leg, and the convulsive movements may be limited to one of these areas; it is common, however, for the disturbance to spread from one area to others until the face and both extremities are involved in a unilateral convulsion. The tendency for unilateral convulsions to spread is very characteristic, and the spread often continues until the convulsion becomes general and all of the voluntary muscles of the body are contracting violently, and the patient is unconscious. The cause of Jacksonian convulsions is some irritation of the cerebral cortex within or in proximity to the motor area, and the convulsive movements are on the contra-lateral side involving muscle groups that are represented by the portion of the motor cortex that is irritated. Although unilateral convulsions were described as early as the time of Hippocrates, Hughlings Jackson, one of the greatest pioneers of neurology, made many contributions to the subject during the years from 1861 to 1870. His work was outstanding, not only in the analysis and interpretation of convulsive symptoms associated with cerebral lesions, but also in promoting the knowledge of cerebral physiology and cerebral localization

from the broadest viewpoint. He called attention to the important fact that functioning groups of muscles may be divided into those which are located on one side of the body, and those which include muscles on both sides. The unilateral muscle groups function unilaterally independent of any synergistic action of muscles on the opposite side, and include muscles in the lower part of the face, of the arm and of the leg. The bilaterally functioning muscle groups are composed of muscles distributed on both sides and not synergistically in bilateral movements. The movements of these bilateral groups cannot be performed as unilateral voluntary movements. Muscles comprising the bilateral groups are those of the trunk, neck, pharynx, larynx and eyes. It was Jackson who noted and emphasized the fact that hemiplegia affects predominately and almost exclusively the muscle groups which function unilaterally. He also noted that the same muscle groups were affected primarily in unilateral convulsioons.

Considering the mechanism of convulsive symptoms, it will be noted that those which are caused by lesions of the spinal cord and the brain-stem are in the nature of grossly exaggerated reflex capacity. The flexion spasms occurring in cases of spastic paraplegia represent in a convulsive form the normal withdrawal reflex elicited by painful stimulation of the foot. Decerebrate rigidity resulting from mid-brain lesions consists of the spasmodic contraction of anti-gravity muscle groups. In each of these instances the convulsive symptoms occur when reflex mechanisms of the spinal cord or the brain-stem are released from the controlling or "inhibitory" influence of motor neural structures at higher levels in the central nervous system. In contrast to the convulsive symptoms due to the release of the lower motor mechanisms from cerebral control are those which are caused by irritations of the cerebral cortex, and in particular the so-called Jacksonian seizures. Irritation of the hand area in the motor cortex causes convulsive movements of the hand which are due to the passage of nervous impulses over the same pathways traversed the impulses which produce voluntary movement. Experimentally, a slight impulse of brief duration causes a quick and localized movement, but with increasing intensity of stimulation the resulting movements extend into other muscle groups whose motor areas in the cortex are not directly irritated. The spread or "march" of the convulsive movements may continue to extend until the convulsion becomes general, the effect resembling the cumulative force of an avalanche. When the spread of convulsive movements in a Jacksonian attack reaches the stage where all of the voluntary muscles are involved, consciousness is lost and the clinical picture is then essentially that of a major epileptiform seizure.

Generalized or epileptiform convulsions, which when habitual are commonly called "epilepsy," constitute one of the outstanding problems of neurology. The neural mechanism of an epileptic fit appears to be a brief but violent discharge of nervous impulses sweeping through the central nervous system, causing powerful tonic and clonic contractions of the entire musculature of the body, arresting respiration with resulting cyanosis, producing a deep state of coma, and often relaxing the sphincters of the bowel and bladder. This discharge of nervous energy might be compared to the discharge of an electric battery or condenser through short-circuits. It may be assumed that each neuron, or structural unit of the nervous system, contains a store of latent energy ready to be discharged through its axon in the form of a nervous impulse when the cell is adequately stimulated. This is the basis of the physiology of the nervous system, and normal function results from the orderly arrangement of neuronal patterns through synapic connections and the orderly discharge of nervous impulses through these patterns. As a hypothesis it might be suggested that the complex neuronal patterns of the motor mechanisms of the brain contain an enormous charge of available potential nervous energy which is normally discharged in an orderly way in physiological activity, and that there is a critical point, or convulsive threshold, beyond which a stimulus will break down the orderly discharge and cause the disorderly or explosive release of nervous energy to produce an epileptiform convulsion. Normally the convulsive threshold is sufficiently high to protect most of us from epileptiform attacks throughout the ordinary vicissitudes of life, but with adequate stimulation, such as an intravenous injection of metrazol, no one is immune. In individuals habitually subject to convulsive attacks, it may be assumed that there is a low convulsive threshold, or that there is some recurrent stimulus of unusual intensity acting on the motor patterns of the brain. It may therefore be concluded, according to this hypothesis, that when a convulsion occurs there has been a stimulus adequate to pass the convulsive threshold, whether the latter is high or low; if we use the familiar terms "predisposing" and "precipitating" factors, the former implies a low convulsive threshold from whatever cause, and the latter some stimulation of known or unknown character applied to the motor mechanism of the brain.

The precipitating causes of epileptiform convulsions are innumerable, and may be assumed to be either physical or chemical in nature, since convulsions can be produced experimentally by either physical or chemical stimuli. A physical (*e. g.*, electrical) stimulus may be adequate to produce a convulsion when applied to the cerebral motor mechanisms at levels from the brain-stem to the cortex; and at the cortical level a stimulus applied to a non-motor part of the cortex, or at some distance from the motor strip, may produce a convulsion. From the standpoint of diagnosis this fact is of great importance, since in many cases it helps to explain the significance of the "aura" and gives a clue to the location of the origin of the precipitating stimulus. A stimulus applied to the cor-

tex tends to spread by contiguity and to excite nervous impulses in adjoining areas. This spread, or "march," of excitation is to a certain extent proportional to the strength of the stimulus and to the excitability of the nervous system. A generalized convulsion results when the spread of excitation attains the momentum of an avalanche of nerve impulses which are discharged over the motor projection pathways. For several reasons it appears that the onset of a general convulsion occurs when the spread of excitation reaches the region of the diencephalon. (1) The sudden loss of consciousness indicates a profound disturbance of the hypothalmic region. (2) The simultaneous onset of a generalized tonic convulsive state closely analgous to decerebrate rigidity. (3) The fact that general convulsions can be induced to decorticated animals, showing the cerebral cortex is not essential for the occurrence of convulsions. (4) The synchronism of clonic movements including the entire musculature of the body indicates nervous discharges at the mid-brain level rather than separate but synchronized discharges in the motor areas on both sides of the brain. (5) The active participation of trunk muscles which have but little representation in the cerebral cortex. (6) The acute disturbances of respiratory, circulatory, pupillary and other functions which are regulated by automatic an dvegetative neural mechanisms at the level of the hypothalamus and mid-brain.

Disturbances of consciousness may be said to be one of the most constant phenomena of all epileptiform convulsions. It is true that in Jacksonian attacks the unilateral convulsions may be severe without loss of consciousness; but even with Jacksonian seizures the patient loses consciousness when the fit becomes general. The accumulation of clinical and experimental evidence strongly indicates that the normal state of awakeness or awareness, *i. e.*, physiological consciousness, depends upon the functional activity of areas in the anterior part of the hypothalamus, and normally integrated, intelligent behavior requires the integrated functions of this area in connection with the basal ganglia and the cerebral cortex. The diencephalon represents the level of "awakeness," and the cerebral cortex the level of intelligence, the memory of experiences, and the processes of thought associations. It seems reasonable to conclude that the loss of consciousness during a general convulsion may be due to the disruption of a delicately adjusted balance of functions which constitute physiological consciousness by the avalanche or explosion of high potential nervous impulses overflowing the limits of the neuronal patterns of normal functions.

From the above considerations it appears that epileptiform convulsions, of whatever cause, present a fairly uniform clinical picture, and are due to violent discharges of nervous impulses from the level of the diencephalon and mesencephalon; these discharges may in turn be due either to an avalanche of impulses originating at a point of irritation in the cerebral cortex, or to direct irritation in the basal region as in the case of tumors of the third ventricle, to convulsant drugs, and to various other factors. A convulsion may therefore be looked upon as a more or less stereotyped clinical symptom comparable to an attack of vomiting or coughing, and like them may be due to any one or a combination of a long series of possible factors; and each case presenting convulsions is a problem for diagnosis.

The following is a partial list of conditions which are recognized as possible factors in the production of epileptiform convulsions:

A. Cortical and subcortical foci from which a spreading or avalanche effect originates which results in convulsions and with the frequent occurrence of aura.

I. Traumatisms which result in cerebral irritation,
   a. Concussion.
   b. Contusion.
   c. Compression.
   d. Hemorrhage.
   e. Laceration resulting in cortical scars.
   f. Meningo-cortical adhesions.
   g. Local ischemia.
   h. Local congestion.
   i. Local edema.

II. Infections which affect the cortex or subcortex.
   a. Meningitis localized over cortical areas.
   b. Intracranial extension of infections from nasal sinuses, middle ear, traumatisms, etc.
   c. Metastatic infection from pulmonary area.
   d. Encephalitis.
      1. Rabies.
      2. Syphilis, paresis and meningovascular lues.

III. Cerebral tumors, cysts, and abscesses involving the cortex or subcortex.

IV. Congential anomalies, hydrocephalus from any cause.

V. Arteriosclerosis resulting in
   a. Cerebral vascular accidents.
      1. Hemorrhages.
      2. Thrombi.
      3. Emboli.
   b. Impaired cerebral circulation.
   c. Areas of softening, porencephaly.

VI. Degenerations.
   a. Lobar sclerosis (Pick's disease).
   b. Diffuse sclerosis (Schilder's disease).
   c. Amaurotic idiocy.
   d. Alzheimer's disease.

B. Physical foci of irritation in the basal region affecting more directly the hypothalamus, midbrain and brain-stem, usually without aura.

I. Traumatism causing lesions in the basal region.
   a. Hemorrhage.
   b. Scar tissue and adhesions.

II. Infections which affect the basal region.
   a. Basal meningitis.
   b. Diffuse meningitis, especially the more severe types.

c. Encephalitis.
   1. Epidemic encephalitis, various strains.
   2. Encephalitis complicating measles, pertusis, mumps, scarlet fever, smallpox, etc.
   3. Encephalitis from vaccinations.

III. Tumors, cysts, aneurisms in the basal region.
   a. Tumors in the third ventricle.
   b. Tumors invading the hypothalamus and mid-brain.
   c. Tumors of the hypophysis.
   d. Arachnoid cysts.
   e. Paracytes and their cysts.
   f. Aneurisms of arteries at the base of the brain.

IV. Spontaneous basal hemorrhage.
   a. Hemorrhage from sclerotic arteries.
   b. Hemorrhage from aneurisms and defective arteries.
   c. Hemorhage due to purpura.

V. Disseminated sclerosis.

VI. High intracranial pressure.

C. Precipitating causes of convulsions where there is no demonstrable pathology of the nervous system, and which probably act directly on the structures of the hypthalamus and mid-brain.

I. Convulsant chemicals and drugs.
   a. Camphor.
   b. Metrazol.
   c. Picrotoxine.
   d. Absinthe.
   e. Alcohol.
   f. Lead.
   g. Phosphorus.
   h. Ergot.
   i. Aconite.
   j. Chenopodium.

II. Endogenous toxicoses.
   a. Uremia.
   b. Eclampsia.

III. Endocrine disturbances.
   a. Hyperthyroidism.
   b. Hypoadrenalism.
   c. Hyperinsulinism.
   d. Hypoparathyroidism.

IV. Metabolic deficiencies.
   a. Anoxia.
      1. Asphyxias, all types.
      2. Surgical anesthesia, especially nitrous oxide.
      3. Stokes-Adams syndrome.
      4. Carbon monoxide.
      5. Carotid sinus reflex.
   b. Hypocalcemia.
   c. Hypoglycemia.
   d. Alkalosis.

V. Peripheral irritations ("reflex epilepsy").
   a. Special eleptogenous or trigger zones.
   b. Phymosis.
   c. Adenoids.
   d. Teething.
   e. Intestinal parasites.

D. Factors of undetermined significance in regard to the etiology of "idiopathic epilepsy."

I. Heredity.

II. Psychic traumata.

III. Allergies.

IV. Infancy and childhood.

Lennox and Cobb have called attention to the fact that certain metabolic factors affect the incidence of epileptic attacks, *e. g.*, acid-base equilibrium, water balance, oxygen supply to the brain, sodium and calcium concentrations in the blood.

Alkalosis favors the occurrence of convulsions, acidosis to prevent them.

Water retention, especially cerebral edema, acts as a precipitant, and dehydration as a preventative.

Oxygen deprivation tends to excite convulsions, and this may be the explanation for the occurrence of convulsions in many cases in which a low oxygen concentration is an incident, such as Stokes-Adams syndrome, irritable carotid sinus, etc.

Low calcium and high sodium concentrations in the blood tend to lower the convulsive threshold, and so are factors in the incidence of spells.

It is common knowledge that children are especially prone to epileptiform attacks during the period of teething and in connection with febrile diseases and gastro-intestinal disturbances. With advancing years the incidence of convulsions progressively diminishes, and it is rather rare for an epileptic habit to begin after the second decade.

The problem of heredity in relation to epilepsy is still a matter for debate. Its importance as a factor has been losing ground in proportion to the increase in knowledge in regard to the organic factors of convulsions, but most writers still consider that many persons are constitutionally predisposed by heredity in some way that renders them susceptible to epileptiform attacks. New evidence has recently been presented on this subject by Lennox, Gibbs and Gibbs (*Journal American Medical Association*, September 9, 1939), based upon electro-encephalographic examinations. In their conclusions they state: "Electro-encephalographic tracings were made simultaneously over six areas of the cortex in 138 parents, children or siblings of patients with epilepsy. Definitely abnormal records were obtained in 54% of the relatives, against 6% in a control group who were unrelated to epileptic persons. In 46 of the families, records were made of both parents. In 28% both parents and in 94% at least one parent had abnormal records. We believe this evidence indicates that the dysrhythmia of epilepsy is inheritable and that such a dysrhythmia when demonstrable may represent a predisposition to epilepsy or some allied disorder."

It is of interest to consider the mechanism of the epileptiform convulsion with regard to the self-limiting factor. In a typical spell the convulsions cease after 1 or 2 minutes, and consciousness returns gradually some time later. Grinker, in his text-book, "Neurology," makes the following comment: "In general, it can be said that the acid-base equilibrium is normal in the interparoxysmal period, perhaps tending slightly to the alkaline side. During and after the fits, perhaps because of asphyxia and muscular contraction, there is acidosis. It may be conjectured that the acidosis, produced by the tetanic apnoea of the fit and by muscular exertion, may explain the spontaneous cessation of

the attack. . . . I have seen cases of status epilepticus where contraction of the muscles of respiration did not occur and extreme dyspnoea was present during the entire fit, so that carbon dioxide was continually being blown off through the lungs. By this means, the alkalosis persisted and the convulsions were continuous until the death of the patient."

Another current theory of the self-limiting factor of the attack is that the violent nervous discharge drains the structures from which they arise of their reserves of available energy and leaves them temporarily exhausted. This theory finds some support in the presence of Babinski's toe reflex immediately after the fit, indicating impairment of pyramidal tract function possibly due to exhaustion. It seems probable that both of these factors, and probably others, may operate to make the epileptiform convulsions a self-limited episode. The rapid recurrence of convulsions in status epilepticus might be explained in part by the alternating discharge and recovery of nerve cells, and in part by the fluctuating acid-base relationship.

It is a striking fact that typical epileptiform convulsions can be precipitated by so many different factors, and that the incidence of attacks is influenced by so many conditions. It is also a striking fact that all epileptiform convulsions are remarkably similar without regard to the causes. The typical fit is a classic picture, and can be produced at will in normal individuals under test conditions. With the classic epileptiform convulsion as a common denominator, and the end result of many different causes, it seems reasonable to infer that all precipitating causes reach and excite the same mechanism, *viz.*, nervous patterns in the diencephalon. "All roads lead to Rome."

In the diagnosis of the convulsive states there are two main problems for consideration: first, the determination of the nature of the convulsion, and the level in the central nervous system from which it originates; and second, the discovery of factors which operate in each particular case to produce the attack. The first problem is comparatively easy if the patient can be adequately observed, or if any accurate description can be obtained. The second problem, especially in the case of epileptiform convulsions, involves a search throughout the broad field of medical diagnosis. Particular attention should be directed to a careful history, including the patient's own story, and the observations by members of the patient's family and associates. Gross lesions of the brain should always be considered and sought for by neurological examination. Spinal puncture, pneumoencephalogram, electroencephalogram, and vestibular tests may contribute important clues in regard to pathology and localization. It is discouraging to state that in studying the so-called epileptics, important evidence as to their etiology is found in less than one-half of the cases; the remainder still fall into the group called "idiopathic" or "true epilepsy," terms which are dignified by age and usage, and by their usefulness in covering ignorance and thereby saving face for the diagnostician.

Narcolepsy, including the episodes of cataplexy, bears an interesting relationship to the convulsive states. Here uncontrolable attacks of somnolence occur, and occasional episodes of weakness and falling termed cataplexy. The disturbance of consciousness resembles sleep rather than coma, as the patient can be easily aroused as from normal sleep. The falling is collapse due to a sudden relaxation of the anti-gravity musculature, and occurs without loss of consciousness. The episodes of cataplexy and particularly by laughing or even by a feeling are commonly precipitated by emotional reactions, of amusement. During the attack, which usually lasts only a few seconds, the pupils tend to dilate, the light reflex is often impaired, and the tendon reflexes cannot be elicited. Most observers concur in the theory that narcolepsy and cataplexy are caused by disturbances in the mechanisms in the diencephalon which regulate sleep and muscle tonus, and many cases have been reported as sequellae to epidemic encephalitis. The contrast between the symptoms of narcolepsy and those of epilepsy are striking, although both appear to arise from disturbances in the same region of the brain. This contrast, however, may have a possible explanation in the theory that the epileptic fit is due to an excessive and explosive nervous discharge, while narcolepsy is a manifestation of deficient or inhibited nervous impulses in the region of the diencephalon.

During the past few years the epileptiform convulsion has attained a new status in the field of medicine, namely that of a widely employed therapeutic measure in the form of artificially induced convulsions. The treatment of schizophrenia and mental depressions by metrazol has produced many strikingly prompt and favorable results, as well as numerous fractures of bones and dislocations of joints, and also some fatalities. As yet no comprehensive theory has been presented to explain the dramatic results which have been obtained by this treatment. It is assumed, however, that in these psychoses the functional derangement is at the diencephalic level, and also that the convulsant, metrazol, acts selectively at the same level.

The problem of the significance of convulsions presents many lines for investigation and the progress of modern research is encouraging. The study of neurophysiology necessitates the interpretation of physical, chemical and electrical phenomena manifested by neurous and axones under varying conditions.

It is important to learn of the varying factors which influence the threshold of nervous discharge and to understand the nature of synaptic transmission. The September, 1939, issue of the *Journal of Neurophysiology* is entirely devoted to a symposium on the synapse. Electroencephalagraphy has contributed much and promises more in regard

(Continued on Page 244)

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DRAFT THE DOCTORS!

Medical men are not policy-makers. Perhaps if they were the world might not be in such a mess as it is today. Scarcely any group could have done worse than those who have blindly allowed a madman to embark on a career of butchery such as now appals civilization. It is useless to say that American medicine is possessed of no opinion regarding the present war in Europe. We must all be rather sadly aware that old values, comfortable maxims, a way of life—all are in the crucible today. What the final product may be, few dare predict. America's doctors, as good citizens of what is yet a democracy, must, like other men, decide soon on a path. To war now, with its attendant horrors—that perhaps our children may know a better world? To peace for the time being, hoping vaguely that somehow, if we muddle through, our children can also? Or, to compromise—try to exist half-way between freedom and vacillation? The choice isn't easy. The terrible reality of our dilemma is here, there, everywhere we turn. There just is no escape now from the necessity of making a choice.

The temper of the American people is plain. A ground swell of fierce resentment against the man who has brought these sad days to the world is apparent in this country. There grows a tendency to ask "why not now?" Responsible men are awakening all over the land, astonished at their long sleep. Americans are re-examining those ideals they have always lived by. The question has been posed—are they worth fighting for? When, now?

The tragic state of unpreparedness that has spelled bitter defeat for the European democracies must not occur here. Medicine must do its part. In case of armed conflict, there will be broken bodies to mend, there will be last rites of mercy to perform. There must remain behind those to care for the civilian population. Wars usually bring epidemics—new problems in public health will arise. How well prepared is American medicine?

A number of the younger physicians proudly hold commissions in the reserves of the Army and the Navy. Patriotically they have worked at training problems, trying to better fit themselves for their posts. But so many are needed, and so few have responded. Plans to draft man power and industry and money should not omit the drafting of medicine. Every physician in this country should be drafted, assigned a post at home or in the field. The income of those left at home should be drastically controlled. Any excess over the scale paid the armed services should be pooled for the benefit of those who had to leave often good paying practices for the small remuneration of the armed services. If there should be no profiteering in industry, neither should there be in the professions! If the younger physicians are to offer their very lives as a pawn to destiny, let the older ones at home at least offer a portion of their monetary gains! Pretty speeches to the young man leaving a family behind, hoping to support them on the meagre salary of a junior officer, are simply not enough. That young man is no fool—he knows that a shattered practice, however good it may have been, will not feed his children. He will rightly resent any attempt on the part of those remaining behind to cash in on his withdrawal from the field. Young men who know they must go at the first call are demanding in growing strength of tone, that organized medicine work out and institute a plan fair to all. They say they only want an even break. The problem is squarely up to organized medicine. And, if our own bodies do not face it, study it, answer it correctly, depend on it that the government of the United States must and will answer it for us.

So, will the various societies of the American Medical Association lay plans of preparedness, or must they be forced to take something perhaps a lot less to their liking? Many others besides America's younger doctors are patiently waiting, waiting.

CANCER IN ARIZONA

In 1939, 6.7 per cent of all deaths in Arizona were due to cancer. Here, again, is a disease which could be prevented through education and, in many cases, cured by reliable medical procedures.

Cancer has for years been a health problem in Arizona, and one which should have the full and

concentrated attention of professional and lay groups alike.

There is a need in Arizona, and for that matter in every other state, for developing means of opposition to certain practices which have been recommended as cancer cures but which, in reality, are absolutely worthless and undoubtedly do more harm than good.

Knowledge of this functional disorder is one of the most powerful methods of prevention and control and, we know, from medical research, that x ray, radium and surgery are the only reliable procedure for cure.

It is hoped that, within a few months, the state health department will have the facilities with which to cooperate with professional groups and organizations in an intensive program of cancer control.

At the present time only a few educational devices are available for such a program. However, with the realization of the need for such work, every effort will be made to develop the necessary facilities and to provide a source of authentic cancer information for the people of Arizona, thus offsetting the fraudulent and unethical practices which may be in use. —Fred P. Perkins, M. D.

PHYSICIANS NEEDED FOR ARMY SERVICE

The physician, like every other American, has become actively interested in our national security and stands ready to contribute his services as required for military preparedness.

The immediate problem in this connection is one that concerns the War Department, and primarily the young physician. The War Department must procure sufficient additional personnel from the medical profession to augment the medical services of the Regular Army as the various increases are made in the strength of the Regular Army, as authorized by Congress to meet the partial emergency. The young physician is especially concerned because it is usually advantageous, and is often more convenient for him to serve with the Army.

Present plans of the War Department are designed to make service attractive and instructive for the young physician. If the physician holds a Medical Corps Reserve commission he can be ordered to active duty if he so requests. If he does not hold a commission, but is under 35 years of age and is a comparatively recent graduate of an accredited school, he may secure an appointment in the Medical Corps Reserve for the purpose of obtaining extended active duty for a period of one year or longer. Duty is given at General Hospitals, Station Hospitals, and with Tactical Units, and embraces all fields of general and specialized medicine and surgery. Excellent post-graduate training is obtainable in connection with Aviation Medicine. After serving 6 months of active duty in the continental United States a Reserve officer may request duty in Hawaii, Panama, or other United States territories and possessions. The initial period for duty is for one year, and yearly extensions are obtainable thereafter until the international situation becomes more clarified and our domestic military program becomes stabilized.

Many young doctors who have served with the Army on extended active duty have taken the competitive examination for entrance into the Medical Corps of the Regular Army. Extended active duty affords an excellent opportunity for the physician to observe modern military medicine and the facilities that exist for a complete and comprehensive medical practice.

Pay is according to rank, and, including subsistence and quarters allowances for an officer with dependents, amounts to an annual sum of $3,905 for a Captain and $3,152 for a First Lieutenant; or, without dependents, to an annual sum of $3,450 for a Captain and $2,696 for a First Lieutenant. In addition, reimbursement is made for travel to duty station and return.

Further information may be obtained by writing to The Surgeon General, U. S. Army, Washington, D. C.

DEATH RATE UP

A slight rise in the United States death rate last year, as compared with 1938, is reported by the U. S. Bureau of the Census in a preliminary tabulation for 1939 just made public.

A total of 1,387,797 deaths last year resulted in a preliminary mortality rate of 10.7 deaths per 1,000 estimated population. In 1938, there were 1,381,391 deaths and the death rate was 10.6. The death rates for 1938 and 1939 were the lowest rates, with the exception of 1933, reported since the death registration area was established in 1900.

Arizona's preliminary rate of 14.2 deaths per 1,000 estimated population was the highest in the Nation last year. The 1939 rate, however, represented a slight decrease from the 1938 rate of 14.6. North Dakota had the lowest rate in the United States last year—7.7 deaths per 1 000 estimated population. The 1938 rate was 7.4.

Twenty states reported decreases in death rates last year, compared with 1938. Rates in 21 states and the District of Columbia last year were above the previous year. Seven states reported the same death rates in 1938 and 1939.

Preliminary death rates for 1939 and final figures for 1938 for the Southwestern States follow:

	1939	1938
Arizona	14.2	14.6
New Mexico	14.1	14.1
Texas	9.8	9.8

Special Section

Arizona State Medical Association

PRESTON T. BROWN, M.D., *Associate Editor*
403 Professional Bldg., Phoenix, Arizona

COMMITTEE ON MEDICAL PREPAREDNESS

Dr. Charles S. Smith of Nogales has been named to serve with the American Medical Association Committee on Medical Preparedness. Dr. Smith was named to this important committee by Drs. D. F. Harbridge, President; W. Warner Watkins, Secretary, and W. Paul Holbrook, Chairman of the Council, as requested by the American Medical Association of these three state association officers.

The American Medical Committee will convene on July 19 for the purpose of outlining the duties of the state association committee representatives, after which time the full program will be put into effect in the various state associations. *The Journal of the American Medical Association* for June 22, page 2466, and again for July 13, page 137, carries full information as to the formation of the committee and its duties, with subsequent issues to report on the progress of the work. The Arizona membership will give full cooperation to this important work.

POST-GRADUATE PEDIATRICS COURSE

For the past two and a half years the Arizona State Medical Association has cooperated with the Division of Maternal and Child Health of the State Department of Health in the interest of mothers and babies entitled to care under the Public Health Division. The physicians over the state have evinced such interest in this work that it is now possible for the Department of Health through the division named to extend a further service to the physicians participating in the MCH program of work. Since the inception of the work, eminent instructors in the fields of gynecology, obstetrics and pediatrics have been brought into the state to present refresher courses for all physicians interested in this type of public health activity. Interest in these programs has so increased that now, for the first time, post-graduate work in pediatrics is being offered the general practitioners over the state who have participated in the MCH work.

Following is the course being offered this summer at the University of California, the State Department of Health for Arizona defraying the travel and registration expense of physicians within the quota who may wish to take the course. While the first course will be under way when this article appears in the *Journal*, it is printed here in order that the profession as a whole may see the full scope of the work being done through the Division of Maternal and Child Hygiene of the State Department of Health in cooperation with the Association Committee on Maternal and Child Health.

Opening Date—July 29, 1940.

Length of Course—Two weeks.

Place—School of Medicine, University of California, San Francisco.

In Charge—Dr. Amos Christie, Associate Professor in Pediatrics, Acting Head, Department of Pediatrics.

The Faculty—Members of the staff of the Department of Pediatrics.

Registration—The Arizona State Department of Health will pay the registration fee for the course and round-trip transportation of each registrant.

This practical course in preventive and clinical pediatrics is part of a series of post-graduate courses to be given at the School of Medicine, University of California, under the sponsorship of six western state departments of public health.

The material in the San Francisco Hospital and the University of California Hospital will be available for study and demonstration. Work on the point of view and special techniques in the conduct of well child conferences will be given. A syllabus of the lectures follows:

1. Introduction and purposes of course.
2. Review of infant feeding.
3. Hazards of the neonatal period and discussion of prematurity.
4. Congenital syphilis, early diagnosis and treatment.
5. Normal growth and development.
6. Heart disease in childhood.
7. Common communicable diseases and standard immunization procedures.
8. Common communicable diseases and standard immunization procedures.
9. Common communicable diseases and standard immunization procedures.
10. Common communicable diseases and standard immunization procedures.
11. Childhood tuberculosis.
12. Digestive disturbances; vitamin deficiency diseases.
13. Allergic diseases (subject to change).
14. Allowance in event of overlapping.

Key reference will be suggested and sufficient time allotted for reading. A seminar will be held each Saturday morning. The following is a tentative outline of a week's schedule:

MONDAY—	9-11—Ward Rounds U. C. Hospital
	11-12—Lecture
	2- 4—Well Baby Conference
TUESDAY—	9-11—Children's Hospital
	2- 4—Lecture Free
WEDNESDAY—	9-11—Ward Rounds S. F. Hospital
	11-12—Lecture
	2- 4—Lecture Free
THURSDAY—	9-11—General Staff Rounds. U.C. Hosp.
	11 12—Lecture
	2- 4—Well Baby Conference
FRIDAY—	9-11—Ward Rounds S. F. Hospital
	11-12—Lecture
	2- 4—Free time to arrange
SATURDAY—	9-11—Seminar
	11-12—Seminar

President's Page

IN THE Arizona Section of the current issue of the *Journal* will be found an outline of a post-graduate course in pediatrics being offered the physicians of the state who have particpated actively in the maternal and child health program under the direction of the Division of Maternal and Child Hygiene of the State Department of Health in cooperation with the Arizona State Medical Association.

For something over two years the Association has been in active cooperation with the Department of Health in this work, the present post-graduate course being a culmination of the great interest manifested in the work on the part of many of our members over the state. Response to the offer of this course has been beyond the expectations of all conconcerned, and the quota to take the course has been met. In fact, all desiring to take the course cannot be accommodated at this time, but will be admitted to future courses.

We point to this work to call attention to the increased interest of our membership in the various committee programs under way and developing. In later issues the work of other committees will be stressed. The committee directng the work of maternal and child health is comprised of: Dr. C. B. Warrenburg, obstetrician, Phoenix, chairman of the committee; Dr. Hugh C. Thompson, pediatrician, Tucson, and Dr. Preston T. Brown, obstetrician and gynecologist, Phoenix. The activities of this committee merit the continuous cooperation of the membership at large, which cooperation is responsible for the post-graduate course in pediatrics now being offered.

Fraternally yours,

D. F. Harbridge

President, Arizona Medical Association.

THE SIGNIFICANCE OF CONVULSIONS

(Continued from Page 239)

to the characteristics of the brain waves associated with convulsive states.

Animal experimentation has extended the knowledge of the effect of various drugs in raising and lowering the convulsive threshold. The neuro-surgeon makes maps of the motory and sensory areas of the cerebral cortex by stimulation with patients under local anesthesia. He also locates eleptogenous foci, and observes local circulatory changes in the brain during spontaneous and induced convulsions.

The clinician, who is forced with the problems of treating patients and explaining matters to their relatives, hopefully applies each newly proposed remedy, which never measures up to hopes and expectations. However, by the application of the accumulated knowledge concerning the factors affecting the convulsive threshold, and careful search for factors which tend to precipitate convulsions, a program can usually be worked out for each patient which will at least partially control the frequency and severity of recurrent convulsions.

University of Southern California School of Medicine, Los Angeles.

COMMUNICATIONS

Sir:

In order that there may be a central source of information with regard to studies of the intravenous drip method of treatment of syphilis ("the five day treatment"), the American Sociel Hygiene Association at 50 West 50th Street, New York, has been asked to gather and to keep available information regarding this subject. The Association requests all physicians and hospitals which are planning or are now carrying on studies of experiments with this method of treatment of syphilis to send brief information regarding the following points to the Association at the above address:

1. Name of hospital or other institution.
2. Name of principal physician in charge of the intravenous drip study.
3. Type of case or cases of syphilis treated by the intravenous drip method.
4. Name of drug or drugs used.
   (a) By the intravenous drip method
   (b) By any other method before, during or after intravenous drip therapy. (Mention any specific therapy used.)
5. Routine laboratory work done on cases of syphilis treated by the intravenous drip method.
6. Usual number of hours of intravenous drip treatment per day per patient.
7. Usual number of days of intravenous drip treatment per patient.
8. Any other pertinent facts.

The Association will be glad, so far as possible, to answer inquiries regarding the intravenous drip treatment of syphilis. The Association has available to physicians, upon request, a brief pamphlet on the subject of the present status of the intravenous drip method of treatment of syphilis, written by Charles Walter Clarke, Executive Director of the Association and a member of the New York City Committee on the Intravenous Drip Treatment of Syphilis.

Very truly,

The American Social Hygiene Association, Inc.

Sir:

With the likelihood of an augmented Army existing for a prolonged period, The War Department has been able to plan accordingly in considering medical requirements.

In reference to extended active duty for Medical Corps Reserve Officers, important changes have been made. Reserve Officers may now serve in Hawaii, Panama, and other United States possessions, and may receive yearly extensions of active duty for an indefinite number of years until the international situation clarifies and until the future can be viewed with more certainty.

Inclosed is a statement pertaining to extended active duty for physicians which probably will be of interest to your readers. Any publicity given to the substance contained therein will be appreciated by this office.

Very truly yours,

JAMES E. BAYLIS,
Colonel, Medical Corps,
Executive Officer.

NEWS

General

The 19th annual scientific and clinical session of the American Congress of Physical Therapy will be held September 2, 3, 4, 5, and 6, 1940, at the Hotel Statler, Cleveland, Ohio.

The mornings will be devoted to our annual instruction course, enabling attendance at both the course and scientific sessions which will be given in the afternoons and evenings. This will minimize the time element and permit attendance at both functions during the same week. The seminar and convention proper will be open to physicians and qualified technicians.

Numerous new features will be manifest in the 1940 program. While every phase of physical therapy will be covered in the general program, special emphasis will be laid on the use of physical measures in general practice. Symposia dealing with light, heat and electricity as important therapeutic adjuvants in general medical and surgical practice

will appeal to every physician interested in modern therapy.

For information concerning the seminar and preliminary program of the convention proper, address American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago.

The next written examination and review of case histories (Part I) for Group B candidates of The American Board of Obstetrics and Gynecology will be held in various cities of the United States and Canada on Saturday, January 4, 1941, at 2:00 P. M. Candidates who successfully complete the Part I examinations proceed automatically to the Part II examinations held later in the year.

Applications for admission to Group B, Part I, examinations must be on file in the Secretary's office not later than October 5, 1940.

The general oral and pathological examinations (Part II) for all candidates (Groups A and B) will be conducted by the entire Board, meeting at Cleveland, Ohio, immediately prior to the 1941 meeting of the American Medical Association.

After January 1, 1942, there will be only one classification of candidates, and all will be required to take the Part I and Part II examinations.

For further information and application blanks, address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh, (6) Pennsylvania.

The tenth annual convention of the Biological Photographic Association will be held at the Hotel Schroeder, Milwaukee, Wisconsin September 12, 13 and 14. This society is interested in the further study of photography as applied to the biologic sciences, and the improvement of its technic. Scientific photographers from all parts of the country will meet to exchange ideas and information on still and motion picture photography as well as the latest developments in color work. Formal papers will be presented outlining new methods of technic, and there will be informal round-table discussions which will be especially instructive. Commercial firms specializing in the manufacture of scientific photographic apparatus and materials will exhibit. There will be exhibited natural color and monochrome prints of biologic and clinical subjects.

The membership of the Biological Photographic Association is composed of professional clinical and biologic photographers as well as physicians, dentists and scientists who are interested in this specialized branch of photography.

Further information concerning the convention program, salon specifications and membership in the society may be had by writing to the Secretary of the Biological Photographic Association, University Office, Magee Hospital, Pittsburgh, Pa.

Michael Reese Hospital announces a full-time intensive course in Electrocardiography, two weeks, August 19-August 31, 1940, by Dr. Louis N. Katz, Director of Cardiovascular Research.

This is an intensive course offered to the general practitioner. There will be practice on several electrocardiographic machines and discussion of the principles of their construction and use. There will be sessions of interpretations of electrocardiograms illustrated by lantern slides, and practice by the student with unknown records. Routine records taken during the time of the course will be discussed. Emphasis will be placed on chest leads and on the importance of the electrocardiogram in coronary sclerosis and myocardial infarction. The mechanism and interpretation of heart irregularities will be developed.

As group and individual instructions will be given, the course is open to both the beginning and advanced student in Electrocardiography. It is planned to individualize the course so that at the end of the period each student will be capable of taking and properly interpreting routine electrocardiograms. In order to accomplish this purpose the class will be limited in number. It is imperative, therefore, that reservations be made early.

For further information address:

Michael Reese Hospital,
Cardiovascular Department,
29th and Ellis Ave.,
Chicago, Illinois.

The Twenty-fifth Annual Session of the American College of Physicians will be held in Boston, with general headquarters at the Statler Hotel, April 21-25, 1941.

Dr. James D. Bruce of Ann Arbor, Mich., is President of the College and will have charge of the program of general scientific sessions. Dr. William B. Breed of Boston has been appointed General Chairman of the Session, and will be in charge of the program of clinics and demonstrations in the hospitals and medical schools and of the program of panel and round table discussions to be conducted at the headquarters.

Plans for a Pan-American Congress of Ophthalmology to be held at the Hotel Cleveland, Cleveland, Ohio, October 11-12, have been announced.

The congress will be sponsored by the American Academy of Ophthalmology and Otolaryngology, which will hold its annual convention immediately preceding the Pan-American gathering.

The U. S. Department of State has expressed its interest and the governments of all the countries of the Western Hemisphere have been invited to send official delegates. It is felt that the meeting will do much toward bringing about an entente cordiale among scientific men of the two Americas, and it is expected that a permanent organization will be effected.

The committee that is developing the congress has the following members: Drs. Harry Gradle, Chicago; Conrad Berens, New York, and Moacyr E. Alvaro, Sao Paulo, Brazil. The executive secretary of the American Academy of Ophthalmology and Otolaryngology, which will be host to the Latin-

American eye specialists, is Dr. William P. Wherry, 1500 Medical Arts Building, Omaha, Neb.

Under the direction of Dr. Berens, papers in Spanish or Portuguese will be made understandable to English speaking ophthalmologists by the use of lantern slides projecting a synposis of each paragraph translated into English. The reverse process will be used with the English papers. Spanish and Portuguese stenographers will be present to record the discussions in the language of the authors.

The congress is open to any ophthalmologist who wishes to register. Non-members of the Academy of Ophthalmology and Otolaryngology may register regardless of attendance at the Academy meeting proper. Individual invitations have been sent to about 1,800 members of the ophthalmologic profession in the Latin-American countries, as well as to the national societies of eye specialists and the universities. Individual invitations were not sent to ophthalmologists in the United States and Canada, but official invitations to them are being printed in the various journals of ophthalmology. A fee of $5 has been set for membership in the congress.

El Paso

The regular monthly Staff Meeting and dinner of the Southwestern General Hospital was held Thursday, May 30, 1940, at 6:30 P. M. in the hospital auditorium. The program was: "Case Report" by Dr. T. J. McCamant.

A regular Staff Meeting of the Hotel Dieu Sisters' Hospital was held June 4, 1940, at 12:10 P. M. in the auditorium of the Nurses' Home. Luncheon was served. The program was as follows:

"The Necessity for Cesarean Section"—Dr. H. Leigh.

Discussion—Dr. F. A. Snidow.

"A Case of Gunshot Wound. The Use of Sulfanilamide in Compound Fractures"—Dr. Louis Breck.

Discussion—Dr. J. L. Stowe.

A regular meeting of the City-County Hospital Staff was held Wednesday, June 26th, 1940, at 6:30 P. M., at City-County Hospital. The program was as follows:

"Case of Large Ovarian Cyst"—Dr. C. H. Sullivan.

Discussion by Dr. J. L. Green.

"Case of Brain Tumor"—Dr. T. H. Crouch.

Discussion by Drs. J. E. Morrison and P. E. McChesney.

Autopsies—Dr. W. W. Waite.

A regular meeting of the City-County Hospital Staff was held Wednesday, July 17, 1940, at 6:30 P. M., at City-County Hospital.

The program was as follows:

"Case of Large Ovarian Cyst"—Dr. J. L. Green.

Autopsy by Dr. W. W. Waite.

"Case for Diagnosis"—Dr. W. H. Stephenson.

Discussion by Dr. S. H. Newman.

Autopsy by Dr. W. W. Waite.

MISCELLANY

DISEASE OF THE CERVICAL LYMPH GLANDS

1. Lymphadenitis (inflammation)
   - Acute:
     - Acute suppurative (septic)
       - Staphylococci and streptococci
       - Tuberculosis
     - Acute nonsuppurative
       - Toxic—rheumatic infection, exanthemata (measles), pediculosis
       - Syphilis—primary and secondary
     - Infectious mononucleosis
   - Chronic:
     - Chronic foci of infection
     - Tuberculosis
     - Syphilis
     - Fungus
2. Secondary neoplasm
   - Carcinoma
   - Sarcoma (melanosarcoma)
2. Lymphoblastoma (either infection or tumor)
   - With characteristic blood changes
     - Leukemia—acute and chronic
       - Lymphatic
       - Monocytic
       - Myelogenous
   - Without characteristic blood changes
     - Hodgkin's disease
     - Lymphosarcoma
     - Reticulum cell sarcoma

—*Penn. Med. J.*

FIVE-DAY SYPHILIS "CURE"

It is still too early for excessive optimism concerning the five day cure of syphilis recently announced by a group from Mt. Sinai Hospital. Those of us whose memories go back far enough, remember Friedman's turtle serum for tuberculosis, Ehrlich's "Therapia Sterilisans Magna"—the original salvarsan, and the gold cure for tuberculosis, as well as many others. There have been preliminary reports in scientific medical journals, but no report of the complete work of the Mt. Sinai group has been published, although we can form some judgment from the lay press accounts of the meeting at which the results were presented.

The drug of choice seems to be mapharsen and the method of administration is by continuous drip for twelve hours out of each twenty-four for five days. The results apparently are startling. Nearly all of the patients seem to have been cured.

There can be no question concerning the quality of the work and of the observations. Suffice it to say that the investigations have been under the immediate direction of Dr. George Baehr and Dr. Louis Chargin, neither of whom is prone to going

off "half-cocked." Their experiments have been limited to the treatment of early syphilis, and if their results can be matched at other institutions we can truly say that one of the greatest forward steps in both clinical and preventive medicine has been made.

The implications of this form of treatment are many and widespread. If early syphilis can be cured within a few days there will be much less late syphilis to treat; one of the great causes for mental disease in late years will be abolished; the costs to the taxpayers both for treatment of patients with syphilis per se and for the custodial care of these same patients with late manifestations of the disease will be cut enormously; congenital syphilis need no longer be a problem, while last but by no means least, active sources of infection will disappear with a constant rapid reduction in the incidence of new cases of the disease.

On the other hand, we cannot refrain from expressing a note of warning. Certainly at this time this type of treatment should be attempted only by those who have studied the method carefully; it can be undertaken only in a hospital where there is a well trained professional staff and adequate laboratory service to make such examinations as may be necessary. It is not a scheme of treatment to be used by the practitoiner or even by the specialist in his office.—Westchester Med. Bull.

ILLEGAL PRACTICE

The committee has enumerated 12 flagrant forms of outlaw practice which should be curbed.

1. Diagnosis, treatment, prescribing, and dispensing by druggists and clerks.
2. The illegal practice of medicine by chiropractors, chiropodists, and podiatrists.
3. The illegal practice of medicine by foreign groups, such as "Chinese healers," "Polish barbers," etc.
4. The practice of dermatology in beauty parlors.
5. The practice of physical therapy in bathing establishments without medical supervision.
6. The diagnosis of disease by physical therapeutists.
7. Corporate medicine as practiced by utility groups and department stores.
8. The treatment of diseases of the eye by opticians.
9. Prescribing and diagnosing by psychologists and lay psychoanalysts.
10. Diagnosis and treatment by naturopaths and food faddists.
11. The practice of medicine by reducing groups and clinics.
12. The performance of eye examinations by motor vehicle inspectors.

N. Y. State J. of Med.

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Address
City State

ERRORS IN DIAGNOSIS

(1) Incomplete Examination:
  (a) Because the diagnosis seems obvious
  (b) Because a certain diagnosis seems likely
  (c) Because the patient is old, infirmities are taken for granted
  (d) Because of fear of offending the sensibilities of the patient
(2) Unfamiliarity with the Disease in Question
(3) Failure to Consider all the Possibilities
(4) Incomplete History
(5) Improper Evaluation of Symptoms
(6) Pain of Uncertain Origin
(7) Lack of Knowledge
(8) Classification of Obscure Conditions as Neurosis

Summary:

(1) Don't take anything for granted; (2) Take a careful history; (3) Make a complete physical examination; (4) Consider all possibilities; (5) Think of the commoner conditions first but don't overlook the rarer ones; (6) Weigh all evidence carefully; (7) Do laboratory work freely, but do not depend solely on the laboratory for a diagnosis; (8) The clinical picture is still the most important factor in formulating a diagnosis; (9) Seek greater knowledge and wider experience; (10) Think of the patient first, last and all the time.—*Ohio State Medical Journal.*

DIAPHRAGMATIC HERNIA (53 Cases)

Symptoms	Number of Cases	Per Cent
Postprandial distress or pain	48	90
Substernal distress or pain	43	81
Upper abdominal distress or pain	37	70
Nocturnal distress or pain	35	66
Alkali relief	33	62
Vomiting	28	53
Heartburn	27	51
Bloating and belching	25	47
Weakness	23	43
Dyspnea, palpitation, tachycardia or cough	22	42
"A lump in lower throat" or dysphagia	14	26
Hunger pain	12	23
Anemia	12	23
Hematemesis	11	21
Tarry or black stools	9	17
Loss of Weight	8	15
Overweight	6	11
Constipation	6	11

—*Rev. Gastroenterol.*

MEDICAL PREPAREDNESS

The state of Europe has forcibly reminded us of the readjustments necessary to adapt a large civilian population to the economy of war. The medical profession, in time of war, has thrust upon it suddenly, problems which do not ordinarily exist, and it, too, must readjust itself to meet them. War medicine and war surgery require special organization; centers for research must be established so that the biology, pathology, and treatment of war wounds and other conditions can be studied. The war in Spain has given us many basic ideas concerning prophylactic excision, preoperative transportation, and immobilization by means of plaster casts for all wounds of the extremities.

Then, too, the manner in which war is waged today has so far been vastly different from the World War. This difference raises the question whether the means for administering medical care and evacuation to the rear, which were in use twenty years ago, will suffice in this newer method of warfare. In the realization that our country must now embark upon a vast program to prepare ourselves, the medical aspects of war assume an important place in the minds of civilian physicians who, in an emergency, will be called upon to bear the brunt of the work, under the supervision of trained army and navy medical personnel. It would seem in order, therefore, that some means be made available to keep doctors informed of current war medicine as part of the preparedness program, and that it be done as soon as possible.—*N. Y. State J. M.*

PRAYER OF THE PHYSICIAN

O God, I pray that I may have absolute intellectual honesty. Let others fumble, shuffle and evade, but let me, the physician, cleave to the clean truth,

Behind
MERCUROCHROME
(dibrom-oxymercuri-fluorescein-sodium)
H.W.&D.
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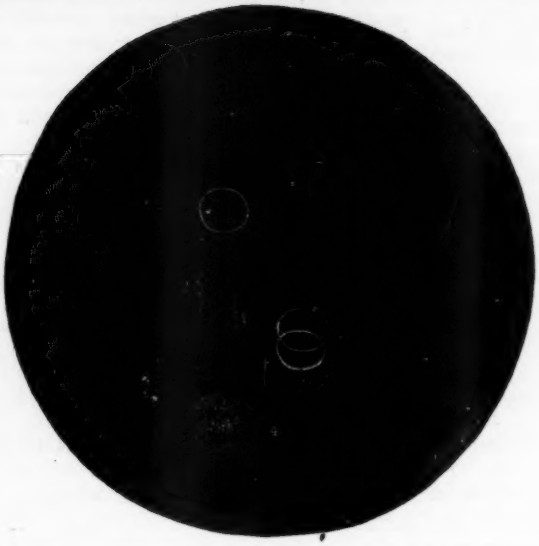

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Cleanse from all credulities, all fatuous enthusiasms, all stubborness, vanities, egotism, prejudices, and whatever else may clog the sound processes of my mind. These be dirt; make my personality as aseptic as my instruments.

Give me heart, but let my feeling be such as shall come over me as an investment of power, to make my thoughts clear and cold as stars, and my hand skillful and strong as steel.

Deliver me from professionalism, so that I may be always human, and thus minister to sickly minds as well as to ailing bodies.

Give me a constant realization of my responsibility. People believe in me. Into my hands they lay their lives. Let me, of all men, be sober and walk in the fear of eternal justice. Let no culpable ignorance of mine, no neglect, nor love of ease, spoil the worth of my high calling.

Give me the joy of healing. I know how far short I am of being a good man, but make me a good doctor. Give me that love and eagerness and pride in my work, without which the practice of my profession will be fatal to me and to those under my care.

Give me a due and decent self-esteem that I may regard no man's occupation higher than mine—envying not the king upon his throne, so long as I am prime minister to the suffering.

Deliver me from playing at precedence; from hankering for praise and prominence; from sensitiveness, and all like forms of toxic selfishness.

Give me money; not so little that I cannot have the leisure I need to put quality into my service; not so much that I shall grow fat in head and leaden in heart, and sell my sense of ministry for the flesh-pots of indulgence.

Give me courage, but hold me back from overconfidence.

Let me so discharge the duties of my office that I shall not be ashamed to look any man or woman in the face. Grant that when, at death I lay down my task, I shall go to what judgment awaits me, strong in the consciousness that I have done something towards alleviating the incurable tragedy of life. Amen. —*Calif. and W. Med.*

BOOK NOTES

(NOTE: Book Notes, "Biochemistry of Disease" and "Hot Irons, Heraldry of the Range," which appeared in the June issue should have been credited to O. H. B. instead of D. F. H.)

SYNOPSIS OF OBSTETRICS: by Jennings C. Litzenberg, M.D., F.A.C.S., Professor Emeritus of Obstetrics and Gynecology, University of Minnesota Medical School. Pp. 394, including index. 157 illustrations. Fabrikoid. Price $4.50, St. Louis, C. V. Mosby Co.

This is another in the series of synopses being brought out by Mosby. As has been the case in other volumes in this group, this book is rather complete in spite of its size, is very well written, is to the point, and is a working reference. No windy

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES, Vol. 23, No. 2, pages 201-206, March, 1939.

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argumentation or theorizing are to be found here. Through a rich experience in his work the author presents the facts as he has found them, leavened of course by the work of others, as must be the thinking of all progressive men of medicine. The book is very much worth while. —*M. P. S.*

ESSENTIALS OF THE DIAGNOSTIC EXAMINATION: by John B. Youmans, M. D., Associate Professor of Medicine and Director of Postgraduate Instruction, Vanderbilt University Medical School. Pp. 417, including index. 36 illustrations. Fabrikoid. Price $3.00. New York, The Commonwealth Fund.

This is a compact hand book containing in brief form most of the known diagnostic procedures needful in a careful and thorough examination. It is written for the general practitioner, is quite practical, is based on common sense and a deep knowledge of underlying pathology. The book is small, easily read, well indexed. It could well find a place in the physician's bag, where it might well be consulted very frequently. The Commonwealth Fund has done the family doctor a distinct service in publishing this excellent reference text.—*M. P. S.*

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